CHAPTER 6

INFLATABLE SURVIVAL EQUIPMENT

Learning Objective: Upon completion of this chapter, you will be able to recognize, inspect, and maintain inflatable survival equipment.

Since naval air operations are predominantly over water, the Navy has developed highly reliable and versatile inflatable equipment designed to meet the needs of aircrew personnel in a water survival situation.

The versatility seen in current inflatable survival equipment meets the ever increasing and diverse needs of the fleet. For example, the life preserver provides more than enough buoyancy to support a person with all survival gear donned, but not sacrifice comfort or adversely restrict movement in the water. It does not interfere with the aircrew member's ability to perform his/her duties aboard the aircraft. The life preserver is flame resistant, lightweight, and has the capability to contain certain survival items. The life preserver is reliable and will save a life, if used properly.

Life rafts provide protection from the cold and hostile environment of the sea. For single- and dual-seat aircraft, a one-man life raft adequately fulfills this function. However, for large aircraft, the 4-, 7-, 12-, or 20-man life rafts will be used. In addition to providing protection from the environment, these rafts carry an adequate number of survival items for their capacity, but are still light enough to carry.

Naval aircraft making operational flights over water are required to carry rafts that will accommodate all the assigned crew, plus passengers. These rafts are manufactured in various sizes and configurations to meet the demands of all type of aircraft.

Pneumatic rafts are compact assemblies, which can be stowed in a small area. They should be stowed so they are readily accessible, preferably near an emergency exit. Never stow a raft under other equipment or cargo or near batteries. Protect them from heaters, engines, auxiliary power units, electronic tubes, or other sources of heat.

If the aircraft flight manual designates a storage place for rafts, this space will be used, unless you are otherwise directed by competent authority. Whenever possible, stow rafts in the same manner in all aircraft of the same model. This enables the crew to become familiar with their location, and thus avoid confusion in the event of a ditching.

Rafts are constructed of rubber-impregnated nylon fabric; therefore, they are susceptible to damage from maltreatment. However, when afloat at sea, they are surprisingly strong and durable, and have a tenacious stability. It is your responsibility as a PR to inspect, pack, and maintain all of the various types of rafts and related equipment carried in aircraft.

INSPECTIONS

All inflatable survival equipment will be subjected to periodic maintenance under the direction and control of the maintenance/material control officer of the activity to which the equipment is assigned. Maintenance must be thorough at all times. No instance of careless treatment or willful neglect of inflatable survival equipment will be allowed to go unnoticed. The vital function of this equipment must be uppermost in the minds of all personnel concerned. The periodic inspection cycles should coincide with the specific aircraft inspection cycles specified in OPNAVINST 4790.2 (series), or personal issue equipment cycle, as applicable.

To meet unusual situations and aid workload scheduling, a period of plus or minus 1 week, or portion thereof, may be applied to the authorized inflatable survival equipment calendar maintenance interval. A period of plus or minus

10% may be applied to equipment in phased maintenance aircraft.

The five different types of life rafts used in naval aviation are the LR-1 and LRU-7/P, which are one-man rafts; the LRU-12/A, which is a four-man raft; the LRU-13/A, which is a seven-man raft; the LRU-14 series, which is a 12-man raft, and the LRU-15/A, which is a 20-man raft.

You may be required to work on only one or you may work on all of them. All require the same three inspections—preflight, special, and calendar/phase.

The preflight inspection is performed on fuselage-installed life rafts before the first flight of the day. This inspection is done by line personnel (plane captain or delegated aircrewman) who have been designated by the line division officer, instructed, and found qualified by the aviators equipment branch.

The special inspection is performed on fuselage-installed life rafts every 30 days. This inspection is made at the organizational level of maintenance by personnel assigned to the aviators equipment branch. Upon completion of the inspection, the date of inspection and inspector's signature are entered in the inspections section of the Aviation Crew Systems History Card.

To perform a preflight/special inspection, visually inspect for the following:

1. Fabric for cuts, tears, deterioration, and abrasion
2. Seams for proper adhesion or stitching
3. Straps and handles for security and wear
4. Any other parts for wear, damage, and security
5. All hardware for security of attachment, corrosion, damage, wear, and, if applicable, ease of operation
6. Life raft retaining line for proper stowage

CAUTION

DO NOT OPEN RAFT ACCESS DOORS, RSSK KITS, OR ANY SEALED OR SAFETY-WIRED PORTION OF THE LIFE RAFT FOR THIS INSPECTION.

Subject each life raft to the **calendar/phase inspection** before you place it in service, or if it is an aircraft inventory item at the time of the aircraft acceptance inspection. Thereafter, the calendar/phase inspection interval coincides with the aircraft inspection cycle in which it is installed. See the applicable Planned Maintenance System (PMS) publications for specific intervals. In no case will the interval exceed 231 days except that the LR-1 (RALSA) inspection is not to exceed 453 days. Unless operational requirements demand otherwise, the life raft calendar/phase inspection is performed at the intermediate level of maintenance or above.

The acceptance/calendar/phase inspection consists of the following major tasks (to be performed in the order listed):

1. Container/case inspection
2. Functional test (if required)
3. Pull cable proof load test (if required)
4. Visual
5. Inflation assembly inspection
6. Leakage
7. Records updating
8. Repacking

Details are listed in NAVAIR 13-1-6.1.

A functional test and pull cable proof load test are performed prior to placing a raft in service or during an aircraft acceptance inspection, and each fourth inspection cycle thereafter. You must make a leakage test at each inspection cycle. If the inspection indicates any damage beyond capability of maintenance, you must forward the entire assembly to supply.

DETERMINATION OF REPAIRABILITY

Life rafts are considered beyond repair for any of the following reasons:

1. Porous fabric areas on tubes
2. Split or open tube seams
3. Leakage test failure resulting from other than a cut, tear, or puncture
4. Damaged or malfunctioning inlet valve, manifold, or oral inflation tube
5. Damaged or malfunctioning topping-off valve that cannot be corrected by replacement of the topping-off valve opening insert
6. Multiplace rafts (leaky bulkheads)

FUNCTIONAL TEST

Before functionally testing a life raft, you should make sure you have enough area to inflate

the life raft. Remember to take into consideration the inflated size of the raft; an LRU-15/A will take 20 times the area that an LR-1 requires.

To begin the test, you first open the carrying case and unfold the life raft. All life rafts have an inflation assembly, and by pulling an actuating cable, you automatically inflate the raft with CO_2.

When you do this, the raft should inflate to design shape, without evidence of restriction, in less than 1 minute. This is a CDI inspection point, so have a CDI inspector watching before you pull the cable. Once the raft is inflated, examine it for obvious defects such as cuts, tears, ruptured seams, and damaged manifold.

PULL CABLE PROOF LOAD TEST FOR MULTIPLACE RAFTS

The pull cable proof load test for multiplace rafts is done in conjunction with the functional test. Also, the test must be performed prior to placing an inflation assembly into service. First remove the inflation valve cover plate and remove the pull cable from the valve. Then apply a 50-pound pull force between the cable ball and the snap hook to determine if the cable is strong enough for the system.

Examine the pull cable for broken strands of wire, deformed snap hook, security of snap hook spring latch attachment, and loose or cracked swage fittings. If any damage is found, the pull cable is discarded and replaced with a new cable. The new cable is also tested. If the snap hook spring latch is loose, it may be repaired in accordance with instructions contained in NAVAIR 13-1-6.1.

If the pull cable passes this test, reinstall the cable. Refer to NAVAIR 13-1-6.1 for details of installation.

LEAKAGE TESTING

The only way that you can be sure that a life raft does not have a leak is to perform a leakage test. To test the LRU-15/A with a vented Y-manifold for leakage, you must ensure that either the manifold inlet is capped or an empty cylinder is installed and the manifold inlet is in the CLOSED position. Install an equalizer tube clamp. These procedures are necessary for this raft due to its design. The LRU-15/A has two flotation tubes; one is on top of the other. The equalizer tube allows $C0_2$ or air pressure to enter both tubes at the same time. If you fail to cap the inlet, you will not be able to hold the pressure within the flotation tube. If you don't use an equalizer clamp, you will blow up both flotation tubes.

NOTE: Flotation tubes must be tested separately to determine internal vertical bulkhead leakage.

All multiplace life rafts are filled with air pressure through the topping-off valves. The LR-1 is inflated through an oral inflation tube.

After you have reached the test pressure (table 6-1), shut off the air supply and wait 15 minutes.

Table 6-1.-Life Raft Test Pressures

Raft type	Compartment	Leakage test pressure (psig)	Minimum pressure (psig)
LR-1	Raft Tube	2.0	1.60
LRU-7/P	Raft Tube	2.0	1.60
LRU-12/A and LRU-13/A	Bow Section	2.0	1.60
	*Inflatable Seat	1.0	0.60
	*Stern Section	2.0	1.60
LRU-14 SERIES	Bow Section	2.0	1.60
	Stern Section	2.0	1.60
	*Upper Tube	1.0	0.60
	*Inflatable Floor Sections	1.0	0.60
	*Inflatable Seat	1.0	0.60
LRU-15/A	*Upper Tube	3.0	2.60
	*Lower Tube	3.0	2.60
	*Floor Support Tube	2.0	1.60
*Compartments may be tested simultaneously			

Table 6-2.—Example of Temperature and Barometric Pressure Check

UNCORRECTED TEST READING 1.70 PSI

	TEMP.	BARO.
START	75°F	29.90 IN. Hg
END	70°F	29.70 IN. Hg
DIFFERENCE	– 5°F	– .20
CORRECTION	+ .155	– .098

TEMP. CORRECTION	+ .155
+ BARO. CORRECTION	– .098
CORRECTION	+ .057

UNCORRECTED READING	1.700 PSI
+ CORRECTION	+ .057
CORRECTED READING	1.757 PSI

Table 6-3.—Temperature Conversion Chart

Temperature Difference (Degree F.)	Correction (psi)
1	0.031
2	0.062
3	0.093
4	0.124
5	0.155
6	0.186
7	0.217
8	0.248
9	0.279
10	0.310
Rise in temperature:	subtract from gauge reading.
Fall in temperature:	add to gauge reading.

After 15 minutes, adjust the air pressure if necessary. At this time you must record the temperature and barometric pressure. This is done because any drop or rise in temperature or pressure affects the pressure within the flotation tube. Allow the raft to remain undisturbed for a minimum of 4 hours. At the end of 4 hours, check and record the test pressure and again record the temperature and barometric pressure. See table 6-2 for an example. By using the conversion charts in tables 6-3 and 6-4, you can determine the correct reading for your raft. If your test pressure is within limits, you are ready to deflate the raft and repack the assembly. If the raft should fail this test, you must determine the cause. Information on testing for leaks can be found in chapter 2 of NAVAIR 13-1-6.1.

CLEANING

As you work on survival equipment you find that cleanliness is very important. It gives the equipment a longer service life, and it reassures the aircrewman that he is using an operational piece of equipment. If he sees a dirty life raft, he may think it is old and that it might leak. To clean life rafts, prepare a solution of cleaning compound (MIL-C-25769) consisting of one part compound and three parts water. Apply the cleaning solution to soiled area with a spray or sponge. Allow the solution to remain on the surface for several minutes, then rub with a soft brush or rag. Rinse the surface thoroughly with water and wipe with a cloth or sponge. Repeat this application until the surface is free from all solution. Dry the raft with a lint-free cloth, and apply a light coating of talcum powder.

HYDROSTATIC TEST OF CO_2 CYLINDERS

Every 5 years you must hydrostatically test the carbon dioxide cylinders used on multiplace life rafts. However, fully charged cylinders are considered serviceable regardless of the last hydrostatic test date. If a cylinder is both due for a test and discharged, disconnect it from the raft. Obtain a new cylinder from supply as a replacement. Forward the old cylinder to supply. (Cylinders must be empty before forwarding to supply.) Before installing the new cylinder, perform the following tasks:

1. Gently tap the inverted cylinder with a small piece of wood. If any rust or other contamination falls from the cylinder, do not use it. Draw another from supply and repeat the contamination check.
2. Ensure that a siphon tube is installed on all multiplace life raft cylinders.
3. Replace the stem in the inflation assembly valve.
4. Install a new sealing washer. Refer to NAVAIR 13-1-6.1.

Table 6-4.—Barometric Pressure Conversion Chart

Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)
.01	.005	.16	.078	.31	.152	.46	.225	.61	.299
.02	.010	.17	.083	.32	.157	.47	.230	.62	.304
.03	.015	.18	.088	.33	.162	.48	.235	.63	.309
.04	.020	.19	.093	.34	.167	.49	.240	.64	.314
.05	.025	.20	.098	.35	.172	.50	.245	.65	.319
.06	.030	.21	.103	.36	.176	.51	.250	.66	.323
.07	.035	.22	.108	.37	.181	.52	.254	.67	.328
.08	.040	.23	.113	.38	.186	.53	.260	.68	.333
.09	.045	.24	.118	.39	.191	.54	.265	.69	.338
.10	.049	.25	.123	.40	.196	.55	.270	.70	.343
.11	.054	.26	.127	.41	.201	.56	.275	.71	.348
.12	.060	.27	.132	.42	.206	.57	.279	.72	.353
.13	.064	.28	.137	.43	.211	.58	.284	.73	.358
.14	.069	.29	.142	.44	.216	.59	.289	.74	.363
.15	.073	.30	.147	.45	.221	.60	.294	.75	.368

Rise in pressure: add to gauge reading.
Fall in pressure: subtract from gauge reading.

5. Thread the inflation valve onto the cylinder and tighten it to a torque value of 600 ± 60 inch-pounds for multiplace life raft cylinders and 400 ± 40 inch-pounds for LR-1 raft cylinders. **The hydrostatic test does not apply to the LR-1 life raft cylinder.**

MULTIPLACE RAFTS

Multiplace life rafts vary in size and in the quantity of equipment they carry.

CNO has established survival equipment lists as standards to be used by all concerned. These lists provide the equipment necessary for an effective 24-hour survival capability.

The body of the life raft consists of an encircling buoyant tube and a fabric bottom. The fabric sections used in the inflatable buoyant tube are incorporated in such a manner that the warp threads of the straight fabric run in a circumferential direction around the tube, and the warp threads of the bias cloth run in the opposite direction in the adjoining sections.

The fabric bottom of the raft is applied without tension across the enclosure formed by the flotation tube, and it is attached securely to the underside.

SEAM TAPES AND PATCHES

All raft seams and patches are secured by the use of self-curing cement, applicable to the specifications listed in the *Inflatable Survival Equipment Manual,* NAVAIR 13-1-6.1.

No sewing or stitches are used in the seams or through the fabric of any compartment. However, sewing is permitted in the construction of patches, oarlocks, disks, flap seats, cylinder carriers, lifeline supports, handles, and pockets.

Seam repair is done only if a flotation tube does not leak; that is, if only the outer seam tape is loose or if the seam does not seal a flotation tube. If the seam tape is present and undamaged, recement the tape to the raft. If the tape is missing, measure and fit a replacement tape to the area and cement it in place. Overlap the seam tape on other seams a minimum of 1 inch.

If the tape is damaged, peel the tape from the raft. Apply toluene only as needed to loosen the tape. Avoid excessive application of toluene on the seams, and remove any spilled or excess toluene immediately.

NOTE: Do not use toluene near open flame, heat, or electrical sparks. Avoid prolonged contact with the skin or breathing the fumes. Use toluene only in well ventilated areas.

Do not touch the cleaned raft areas when handling. Clean both the pieces to be cemented with four applications of toluene. Apply the toluene with back-and-forth strokes on the first and third applications and one-waystrokes on the second and fourth. Allow the areas to dry between applications.

Prepare cement and accelerator mixture. Prepare only enough mixture to last for 8 hours, as this is the effective active period for the mixture. Dispose of any remaining mixture after 8 hours.

Using a disposable brush, apply cement to completely cover surfaces to be cemented.

Apply two coats of cement to both pieces, allowing the first coat to dry for approximately 10 minutes.

When the second coat of cement becomes tacky, place the pieces together. If the cemented area is a cut or tear, butt the edges of the damaged area before applying a patch. Roll out the bubbles using a wooden roller.

Allow the cemented area to dry for at least 48 hours, and then dust the area with talcum powder.

If the seam tape is only damaged, trim the old tape and replace it with new tape. Overlap the other seam tape a minimum of 1 inch. All tapes and patches are applied to the life raft without tension. The tape is applied in such away that an equal amount of tape width is on each side of the seam edge, which it covers.

To patch a damaged area on a life raft, select the applicable color and type of raft cloth, depending on the type of raft to be repaired. Cut a rounded patch 1 inch larger than the damaged area on all sides. Scallop the edges of the patch if it is larger than 5 inches in diameter.

If the damaged area in the floor is larger than 1 inch, patches must be applied to both sides. Intermediate maintenance activities have the prerogative to declare rafts beyond the capability of maintenance if internal patching is required.

Center the patch over the damaged area and trace an outline of the patch on the raft fabric.

Cement the patch to the damaged area in accordance with the instructions previously discussed in this section. After all repairs have been made, perform a leakage test on the raft and dust the repaired area with talcum powder.

BULKHEADS

The flotation tube is separated into two compartments by internal vertical bulkheads. Bulkheads are constructed of laminated cloth and are of a six-gore hemispherical design. The bulkheads are installed amidships, equidistant from the bow and stern so that the volume of the two compartments is equal. A 4-inch-diameter patch of laminated cloth is securely cemented to each side of the bulkhead, at the manifold, to protect the bulkhead against abrasion by the manifold diffusers when the raft is packed in the carrying case.

INFLATABLE SEATS

An inflatable seat is installed in certain multiplace life rafts; for example, the LRU-12/A, LRU-13/A, and LRU-14 series. These seats are circular and are made of laminated cloth. The ends of the seat are tailored to fit the curvature of the flotation tube. The inflatable seat is an independent air chamber and is manually inflated through the topping-off valve by using the hand pump provided. It is attached to the bottom of the raft with Y-shaped hinge tapes made of laminated cloth. This method of attachment allows for expansion and prevents undue stresses between the bottom of the raft and the seat.

SUPPLY POCKET

Each LRU-12/A, LRU-13/A, and LRU-14 series life raft contains a supply pocket that measures approximately 8 x 8 x 2 inches. The pocket is attached to the starboard side of the flotation tube surface inside the raft by stitching the pocket to a patch and cementing the patch to

the tube. Using black washproof ink, ensure that each pocket is clearly marked SUPPLY POCKET in 1/2-inch letters on the LRU-12/A and LRU-13/A rafts. The lettering should be l-inch high on the LRU-14 series supply pocket.

In addition to the starboard supply pocket, the LRU-14 series raft has a port supply pocket. This pocket is attached to the raft in the same manner as previously discussed. The lettering height on the port pocket is 1 inch for the first line and 1/4 inch for all other lines.

COMBINATION SUPPLY POCKET AND BAILER

Each life raft, except the LRU-15/A, contains one detachable combination supply pocket and bailer. The pocket is closed by means of a slide fastener across the top, which is sealed with tape after the equipment is packed. A loop of spring wire is contained in the seam around the slide fastener so that the pocket may be fashioned into a bailing container. One end of a 5-foot length of type III nylon suspension line is secured to the slide fastener wire stirrup pull; the other end is attached to the nearest lifeline patch loop.

The words SUPPLIES AND BAILER are stenciled in 1/2-inch letters on the pocket. Below this, stenciled in 1/4-inch letters, are the pocket contents.

The Supply and Bailer pocket on the STBD side of LRU-12/A, -13/A, and -14 series has been deleted from newly procured rafts. New rafts are not reworked to provide pocket and on older rafts they need not be removed.

LIFELINE

A lifeline of natural color nylon rope, 1/4-inch diameter, encircles the outboard perimeter of the raft. The lifeline is attached to each lifeline patch loop with an overhand knot tied on the inner side of each patch loop so as to prevent the line from running free through the loops. Four inches of slack is allowed in the line between the lifeline patch loops. Each completed lifeline patch can withstand a 250-pound pull exerted in a direction perpendicular to the base of the patch.

The lifeline provides a means for securing the accessory containers to the life raft by using a 10-foot length of type 111 nylon cord.

The LRU-15/A life raft also has an inner lifeline that provides for the safety and survival of aircrewmen.

RIGHTING HANDLES

Righting handles are provided on all life rafts except the LRU-15/A. These handles provide a means of righting a capsized raft.

TOPPING-OFF VALVES

Topping-off valves are installed on each flotation tube, inflatable seat, each section of inflatable floors, and each side of the floor supports. The required number of topping-off valves and their location on the rafts may vary depending on the type of raft concerned.

Topping-off valves are used for manual inflation purposes in conjunction with the hand pump. The valve also serves as a means for relieving high internal tube pressure that may possibly build up during hot, sunny days.

Two topping-off valves are installed on the same side of the raft's main flotation tube—one on each side of the internal bulkhead—above the inside horizontal centerline of the tube, 4 inches from the point of attachment of the vertical internal bulkhead.

Stenciled instructions relative to topping-off and deflation of the raft are applied on the raft flotation tube adjacent to the topping-off valves. Appearing in 1/4-inch, washproof black ink letters, the instructions are stenciled on a white rubber patch as follows:

> TO INFLATE COMPARTMENTS MANUALLY: Attach hand pump to valve cap, unscrew cap 1 1/2 turns to the right and then pump to inflate. When desired pressure is attained, re-tighten valve cap and remove pump.

TO DECREASE PRESSURE: Open valve 1 1/2 turns to the right and bleed.

INFLATION SYSTEM

The valve of the CO_2 cylinder is threaded into the coupling nut of the manifold. Since multiplace life rafts are constructed with internal bulkheads, the purpose of the manifold is to provide a common means of directing and diffusing the flow of carbon dioxide entering the raft's inflatable tube chamber. The manifold outlets must bridge the internal bulkhead over which they are mounted. Figure 6-1 illustrates the operation of the raft's CO_2 inflation system manifold.

All of the exposed metal surfaces of the inflation system that might chafe the raft fabric while packed must be covered with several layers of rubber-coated cloth, and secured with cloth-based, pressure-sensitive tape.

Because of space limitation, this chapter cannot possibly contain all of the available information concerning life rafts. *The Inflatable Survival Equipment Manual,* NAVAIR 13-1-6.1, is referenced for more detailed information.

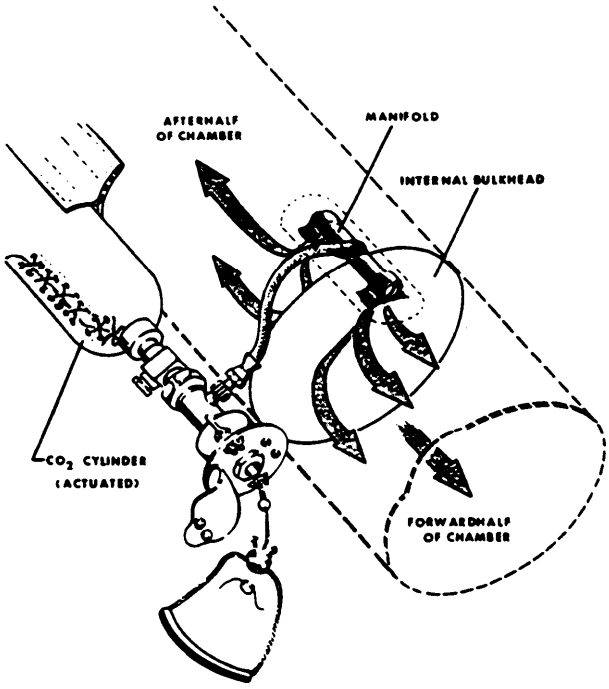

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Figure 6-1.—Multiplace raft CO_2 inflation system manifold operation.

LRU-12/A LIFE RAFT ASSEMBLY

The LRU-12/A life raft assembly consists of an inflation assembly (carbon dioxide cylinder and inflation valve) and a four-man raft. Two types of carbon dioxide cylinders and four types of inflation valves are approved for service use. The life raft is made up of a two-compartment main tube; an inflatable seat attached to the main tube; a noninf'latable floor attached to the bottom of the main tube and inflatable seat; and a sea anchor, which is used to retard drifting. A lifeline, a righting line, a supply pocket, and a combination supply pocket and bailer are attached to the main tube.

Boarding and righting handles are attached to the main tube and the floor. Emergency survival equipment and raft accessories, stowed in accessory containers, are provided for the safety and survival of the aircrewmen. The lifeline also provides a means for securing the accessory containers to the life raft. Topping-off valves are located on the main tube and inflatable seat. An LRU-12/A life raft is shown in figure 6-2.

NOTE: To makeup the packaged life raft assembly complete with accessories and survival items, all required components not supplied with the raft assembly must be individually requisitioned.

The LRU-12/A life raft assembly (droppable) is inflated by pulling the inflation assembly actuating handle, located under the carrying case end flap. The LRU-12/A life raft assembly (raft compartment installation) is automatically inflated and ejected after the raft compartment door has been released. After boarding, the inflatable seat should be inflated through the topping-off valves with the hand pump provided in the accessory container.

The LRU-12/A life raft assembly can either be dropped to survivors or used by aircrewmen in the event of an aircraft ditching emergency. The raft is stowed in a readily accessible area inside the aircraft fuselage on all applicable aircraft except the S-2 series.

Prior to packing any life raft, the assembly must be updated by comparing the configuration of the assembly with the modifications listed in the applicable chapter in NAVAIR 13-1-6.1.

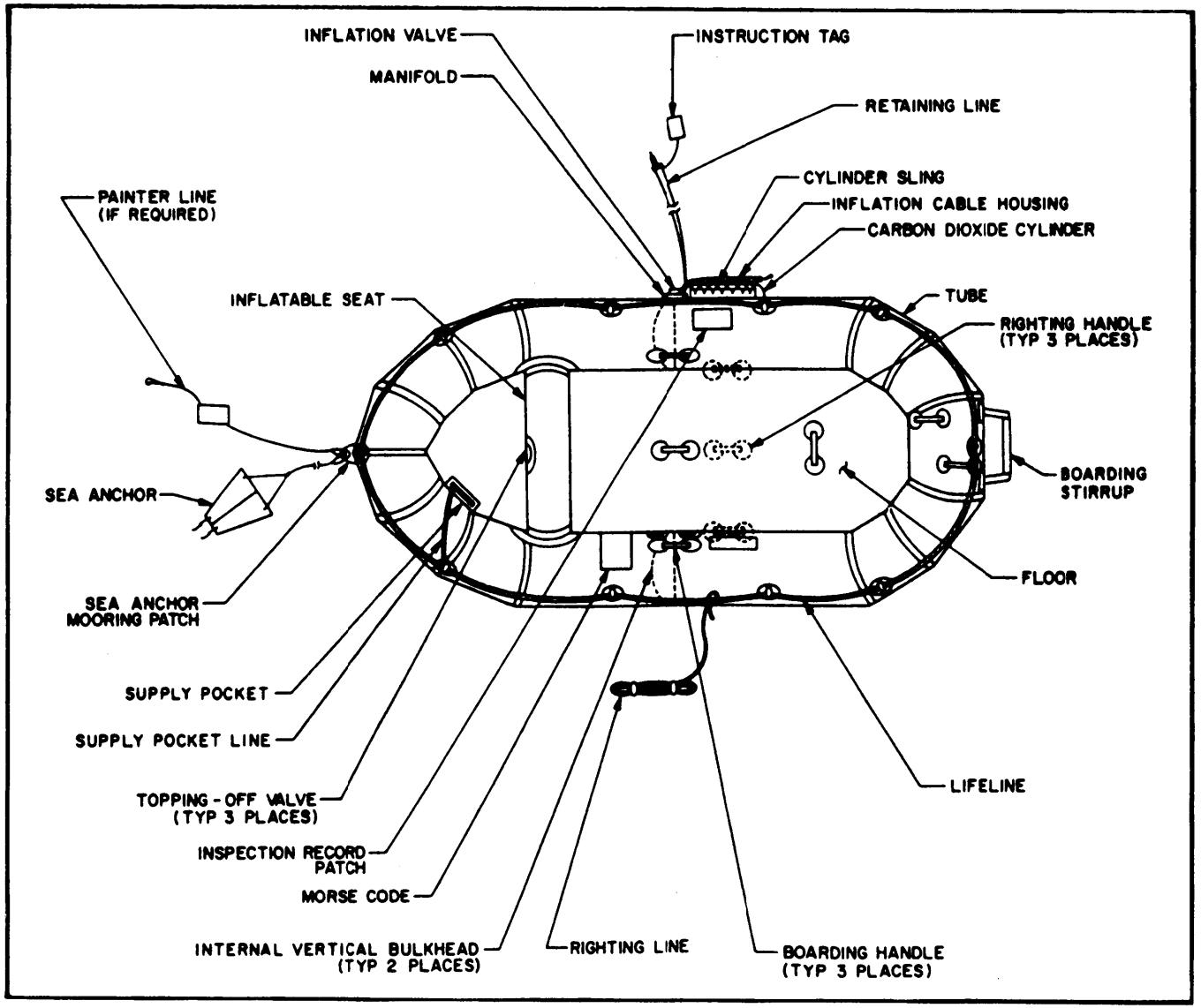

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Figure 6-2.—LRU-12/A life raft assembly, parts nomenclature.

Survival items are intended to provide a means for sustaining life, aiding in escape and evasion, and for a suitable detection capability. Survival items may be packed in life rafts, droppable kits, kits intended to be carried or worn by the aircrewmen, or they may be individually carried.

The equipment and survival items carried in the LRU-12/A life raft assembly differ from that carried in other rafts basically in the quantity carried, with a few minor exceptions. Table 6-5 lists the survival item requirements and the applicable item storage container and pocket for LRU-12/A, LRU-13/A, LRU-14 series, and LRU-15/A life rafts.

LRU-13/A LIFE RAFT ASSEMBLY

The LRU-13/A life raft assembly consists of an inflation assembly (carbon dioxide cylinder and inflation valve) and a seven-man raft. Two types of carbon dioxide cylinders and four types of inflation valves are approved for service use. The life raft is made up of a two-compartment main tube; an inflatable seat attached to the main tube; a noninflatable floor attached to the bottom of the main tube and inflatable seat; and a sea anchor, which is used to retard drifting. A lifeline, a righting line, a supply pocket, and a combination supply bag and bailer are attached to the main tube. Boarding and righting handles are attached to the main tube and the floor. Emergency survival equipment and raft accessories are stowed in the accessory containers. The lifeline also provides a means for securing the accessory containers to the life raft. Topping-off valves are located on the main tube and the main seat. The LRU-13/A life raft assembly and parts nomenclature are the same as the LRU-12/A (shown in figure 6-2), except that the LRU-13/A is longer.

EQUIPMENT AND SURVIVAL ITEMS

The LRU-13/A life raft equipment and survival item requirements and the applicable storage container are listed in table 6-5.

PACKING PROCEDURES REMOTE OR LOCAL PULL

Prior to packing the LRU-13/A life raft assembly, it must be updated by comparing the configuration of the assembly with the modifications listed in NAVAIR 13-1-6.1.

The LRU-13/A life raft assembly may be packed for droppable inflation, or for installation into the aircraft nacelle or raft compartment. The method used for packing depends upon the aircraft application.

NOTE: The inflation cable housing must not be inserted through the abrasion patch sleeve when folding and packing the raft. The cable housing should be inserted into the sleeve after the raft is inflated.

Here are the packing procedures for the LRU-13/A life raft assembly. These packing procedures apply to all methods of packing unless a specific method for either the droppable or local mode of inflation is specified in parentheses.

1. Ensure that the raft, carrying case, and accessory container have been inspected.

2. Ensure that the survival items and raft accessories have been inspected for expiration and damage. Refer to table 6-5 for items used.

3. Wrap all sharp or pointed metallic accessories and survival items with rubber-coated cloth, and secure the objects with rubber bands. Stow the accessories and survival items in the accessory container, or the supplies and bailer pocket, as applicable.

4. Cover the inflation valve with several layers of rubber-coated cloth, and secure it with cloth-based, pressure-sensitive tape. Take the webbing retaining line, righting line, and sea anchor mooring line and secure them with rubber bands. Ensure that all of the topping-off valves are closed and the raft is completely deflated.

5. Using a 10-foot length of type III nylon cord, tie the accessory equipment container to the nearest lifeline loop located next to the CO_2 cylinder, and stow the container inside the raft.

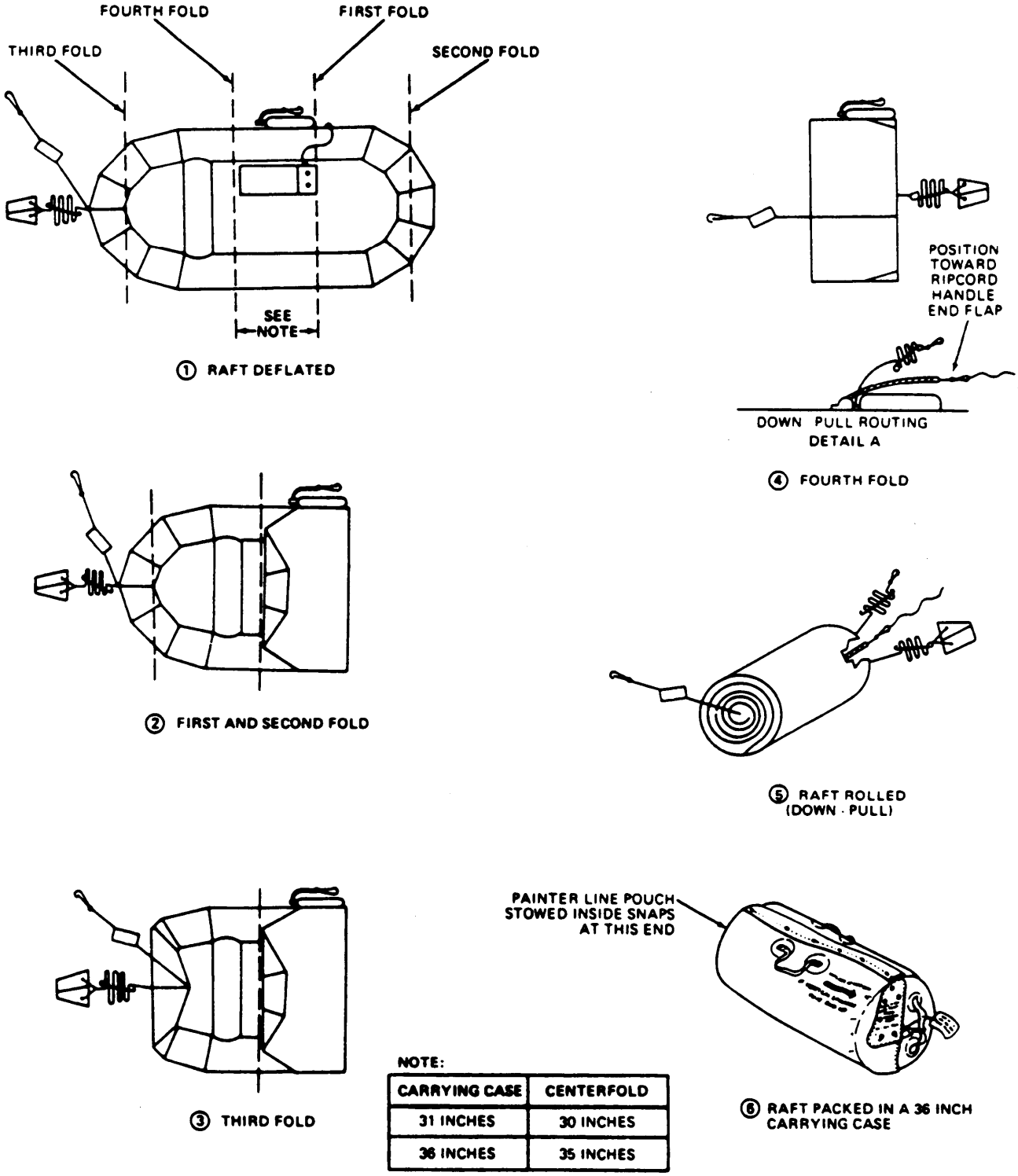
Table 6-5.—Life Raft Survival Item Requirements and Item Storage Containers for LRU-12/A, LRU-13/A, LRU-14 Series. and LRU-15/A Life Rafts

Description	Quantity required			
	LRU-12/A	LRU-13/A	LRU-14 SERIES	LRU-15/A*
Packed In Accessory Container				
Sea Dye Marker	3	4	5	6
Distress Signal, MK-13 MOD 0 (2) or Distress Signal, MK-124 MOD 0	4	6	8	10
Water Storage Bag (Size A)	2	3	4	7
Water, Drinking, Canned, Emergency	4	7	12	20
Opener, Can, Hand (8)	1	1	1	2
First Aid Kit, Size A	1	1	1	2
Sunburn Preventive Cream (1) or Sunburn Preventive Preparation	1	1	2	3
Food Packet, Liferaft	4	7	12	20
Bailing Sponge	1	1	2	2
Hand Pump, Type III	1	1	1	2
Combat Casualty Blanket Type I	1	1	2	3
Hand Generated Flashlight A-9(3)	1	1	1	1
Canopy Rib Assembly	–	–	3	–
Bailing Bucket	–	–	2	–
3 - Sectional Oars	–	–	2	–
Patch, Mechanical (10)	–	–	–	2
Packed In Supply Pocket				
Flare Gun, MK-79 MOD 0	1	1	1	2
Signal Light (Strobe) SDU-5/E	1	1	1	1
Signal Light (Steady Burning) SDU-30	1	1	1	1
Signal Mirror, Type I (4) or Signal Mirror, Type II	1	1	1	1
Survival Radio (5) (6) or Radio Beacon AN/URT-33A	1	1	1	1
Battery (9)	1	1	1	1
Code Card (7)	1	1	1	1
Whistle, Type II	1	1	1	1
Compass, Pocket, Type MC-1 (1) or Compass, Wrist	1	1	1	1
Pocket knife	1	1	1	1
Cord, Nylon, Utility, 50 feet	1	1	1	1

Notes:

(1) No longer procured. This item should be utilized (in lieu of substitute item) until stock has been depleted.
(2) The MK-13 shall be used until depleted. The MK-124 will replace the MK-13 as stock becomes available.
(3) Required for Arctic missions; optional otherwise.
(4) The Type II mirror (large) shall be utilized in lieu of the Type I mirror (small) until stock of the Type II mirror is depleted.
(5) Stock levels may dictate a particular survival radio be used. This will be directed by the Area Commander. If no type survival radio is available, each liferaft shall have an AN/URT-33 beacon.
(6) If PRT-5 transmitters are carried, they shall be packed in the accessory container.
(7) Order from Naval Publications and Forms Center (refer to paragraph 1-12) (stock number 0800-LP-000-1500).
(8) Wrap cutting edges with rubber-coated cloth and secure with a rubberband.
(9) Ensure battery service life does not expire prior to the next scheduled calendar inspection. Refer to NAVAIR 16-30URT33-1 for battery service life.
(10) Patch, mechanical, is made in accordance with MS27826-1, size 3 7/8 inches by 2 1/2 inches).

*All items packed in accessory container.



CARRYING CASE	CENTERFOLD
31 INCHES	30 INCHES
36 INCHES	35 INCHES

Figure 6-3.—LRU-l3/A raft-folding procedures (droppable).

6. (Fold the raft in accordance with figure 6-3, for droppable inflation).

7. Insert the folded raft into the carrying case so that the actuating handle or pull cable housing is positioned under the carrying case end flap.

8. Secure the carrying case snap fasteners.

NOTE: If the actuator case snap hook is not soldered, wrap tape around the hook to prevent possible loss of the spring latch.

9. Rig the pull cable housing to the carrying case ripcord.

10. (Install the ripcord and safety tie the first and last ripcord pins by passing a 12-inch length of size E nylon thread under the ripcord pin). Secure the thread to the ripcord cable with three or four half-hitches (fig. 6-4).

NOTE: Rafts stowed inboard on aircraft are secured to the aircraft with a painter line. The painter line is a 60-foot length of cotton cord (unless otherwise specified by the applicable aircraft MIM), type I, size 4, with a 50- to 150-pound static breaking strength.

The painter line retains the deployed raft to the aircraft, but will easily break if the aircraft sinks. The painter line is attached to the sea anchor mooring patch loop unless otherwise specified by the applicable aircraft MIM. Stow the painter in the painter line pouch, and place the pouch under the packed raft if possible.

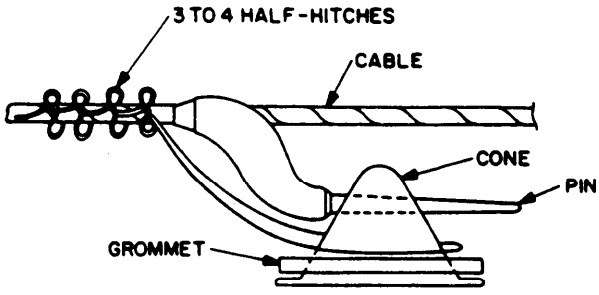


Figure 6-4.—Safety tying ripcord.

11. (Snap the ripcord protector flap closed, position the ripcord handle under the carrying case end flap, and snap the end flap closed).

12. (Ensure that the inflation valve actuating handle is positioned outside the carrying case end flap, and snap the end flap closed).

When the LRU-13/A life raft assembly is packed for installation into the aircraft nacelle or raft compartment, follow procedures outlined in the applicable aircraft MIM.

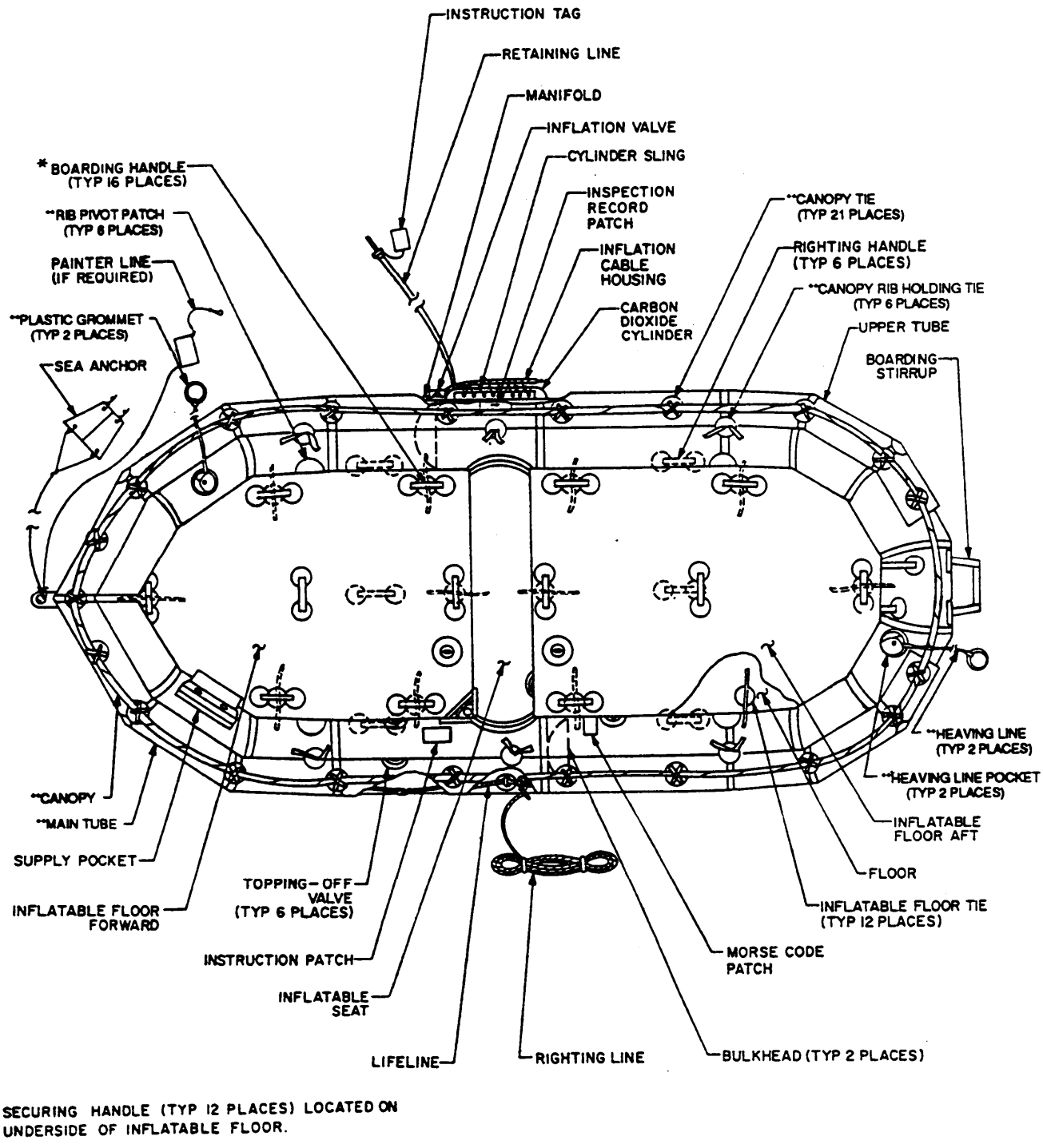
All LRU-13/A life raft assemblies installed in C-1 aircraft must be packed for down-pull inflation using the "snap hook" remote actuator assembly, which consists of a snap hook pull cable assembly and a pull cable housing assembly. In no instance should "ice-tong" remote actuator assemblies be used in C-1 aircraft.

LRU-14 SERIES LIFE RAFT ASSEMBLY

The LRU-14 series life raft assembly consists of an inflation assembly (carbon dioxide cylinder and inflation valve) and a 12-man raft. Two types of carbon dioxide cylinders and two types of inflation valves are approved for service use.

The life raft is made up of a two-compartment main tube; a smaller single-compartment upper tube, which is permanently attached to the top of the main tube; an inflatable seat attached to the main tube; a noninflatable floor attached to the bottom of the main tube and seat; a two-section inflatable floor tied to the inside of the noninflatable floor; and a sea anchor, which is used to retard drifting.

A lifeline and a supply pocket are attached to the main tube. Boarding and righting handles are attached to the main tube and both floors. Survival equipment and raft accessories, stowed in the accessory container, provide for the safety and survival of the aircrewmen. The lifeline also provides a means for securing the accessory containers to the raft. Topping-off valves are located on the upper tube, inflatable seat, and on both sections of the inflatable floor. The LRU-14



* SECURING HANDLE (TYP 12 PLACES) LOCATED ON UNDERSIDE OF INFLATABLE FLOOR.

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Figure 6-5.—LRU-14 series life raft assembly, parts nomenclature.

series life raft assembly parts nomenclature is shown in figure 6-5.

EQUIPMENT AND SURVIVAL ITEMS

CNO has established survival equipment lists as standards for all concerned. These lists provide sufficient equipment and items for 24-hour survival.

The LRU-14 series life raft equipment, survival item requirements, and the applicable storage container are listed in table 6-5.

NOTE: To make up the package life raft assembly complete with accessories and survival items, all required components not supplied with the raft assembly must be individually requisitioned.

OPERATION

The LRU-14 series life raft assembly is inflated by pulling the inflation assembly actuating handle, located under the carrying case end flap. The inflation assembly inflates the main tube only. After the survivor boards the raft, the upper tube, seat, and floor sections should be inflated through the topping-off valves, with the hand pump provided in the accessory container.

The LRU-14 series life raft assembly can either be dropped to survivors or used by aircrewmen in the event of an emergency. The raft is stowed either in a readily accessible area inside the aircraft fuselage or in an aircraft compartment designed for rafts.

Prior to packing, the LRU-14 series life raft assembly should be updated with the modifications listed in NAVAIR 13-1-6.1.

The LRU-14 series life raft assembly maybe packed for droppable or aircraft installation. The method used depends upon aircraft application (fig. 6-6).

LRU-15/A LIFE RAFT ASSEMBLY

The LRU-15/A life raft assembly consists of an inflation assembly (carbon dioxide cylinder, inflation valve, and cover) and a 20-man life raft.

The life raft is made up of two single-compartment circular tubes connected by an equilizer tube; a noninflatable floor suspended

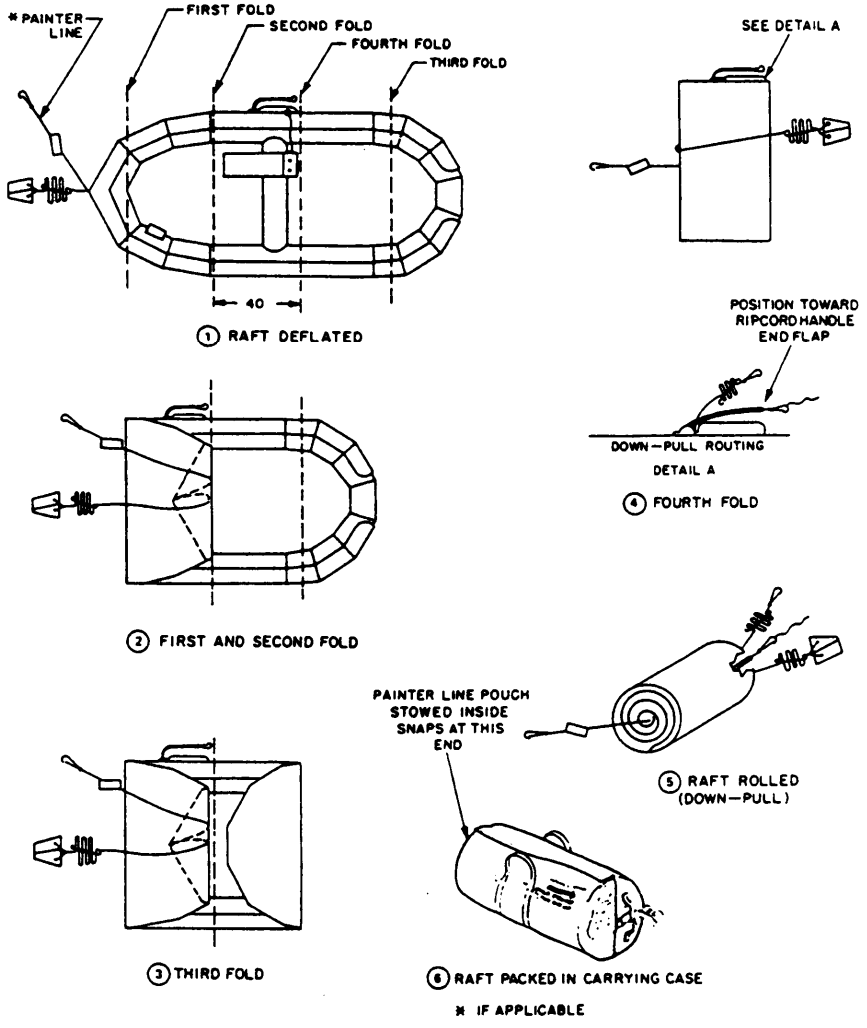

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Figure 6-6.—LRU-14 series folding procedures (droppable).

between the circular tubes; and a boarding ramp permanently attached to each circular tube. The floor is equipped with a built-in inflatable floor support, and the inflatable boarding ramps are located on opposite sides of the raft.

A sea anchor, used to retard drifting, is stowed in the sea anchor pocket, which is located at the junction of the circular tubes. An inner lifeline, boarding handles, a heaving line, and emergency survival equipment, stowed in the accessory container, are provided for the safety and survival of the aircrewmen. The inner lifeline, attached to the floor, and the boarding handles, attached to the circular tubes and boarding ramps, are used to secure the accessory container to the raft. Topping-off valves are located on each side of the tubes. A topping-off valve is also located on each side of the floor support. The LRU-15/A life raft assembly parts and nomenclature are shown in figure 6-7.

EQUIPMENT AND SURVIVAL ITEMS

The LRU-15/A life raft equipment and survival item requirements and the applicable storage container are listed in table 6-5.

The LRU-15/A life raft assembly (droppable) is inflated by pulling the inflation assembly handle, located under the carrying case end flap.

The LRU-15/A life raft assembly (wing installation) is automatically inflated and ejected from the raft compartment after the life raft compartment door has been released. A unique design feature of the LRU-15/A is that it is always right side up after inflation. The inflation assembly inflates the circular tubes and boarding ramps only. In the event that the inflation assembly does not function properly, the equalizer tube distributes gas equally between each circular tube. After boarding, the floor support is inflated with the hand pump provided in the accessory container. The circular tubes may be topped off, if necessary, from either side of the raft floor.

The LRU-15/A life raft assembly can be either dropped to survivors or used by aircrewmen in the event of an emergency. Each type of packaged LRU-15/A life raft assembly is used in certain types of aircraft; for applicable configurations, refer to the aircraft MIM.

Prior to packing the LRU-15/A life raft assembly, it must be updated by comparing the configuration of the assembly with the modifications listed in NAVAIR 13-1-6.1.

EMERGENCY REPAIRS

Emergency repair of the LRU-15/A raft, when in the water, is accomplished by the use of the metal clamp type plugs provided in the accessory equipment container of each raft. No emergency repair equipment is provided with other types of rafts.

DEMONSTRATING THE USE OF RAFTS

Many ditching and water crashes occur in a rough sea or at night. Only complete familiarization with the use of survival equipment will give the aircrewman a chance of survival under such adverse conditions. Therefore, intensive drill in the use of rafts and their associated equipment is essential for safety.

The survival officer must be concerned with survival techniques and should see that a survival training program is set up in the parachute loft. In most cases, the chief in charge of the loft has the responsibility of setting up this training. As a PR2 you will have many occasions to participate in this training and, in many instances, may be completely responsible for the carrying out of the program. Regardless of who is in charge and must shoulder the complete responsibility, it is the duty of every PR to be completely familiar with all phases of survival training and to be able to demonstrate the use of survival equipment.

The multiplace egress trainer is a very effective system of training in water survival techniques. It is used to simulate an actual aircraft ditching, and to teach the best escape procedure with full equipment.

Although such complete courses of training cannot be conducted in certain localities because of the lack of specialized equipment, the PR should make every attempt to give aircrewmen frequent practice in the actual use of the equipment. Discussions, demonstrations, and shop lectures are all helpful, but working with the actual raft equipment is the only way to acquire the knowledge essential to survival.

In demonstrating the raft's use, the most important thing to stress is that the retainer lanyard snap is firmly attached to the ring on the life vest before inflating the raft. Inflate the raft as soon as possible so that personnel can get out of the water. The raft is inflated by pulling on the short length cable attached to the $C0_2$ cylinder valve. After several hours, the CO_2 cylinder may be removed from the side of the raft. It tends to

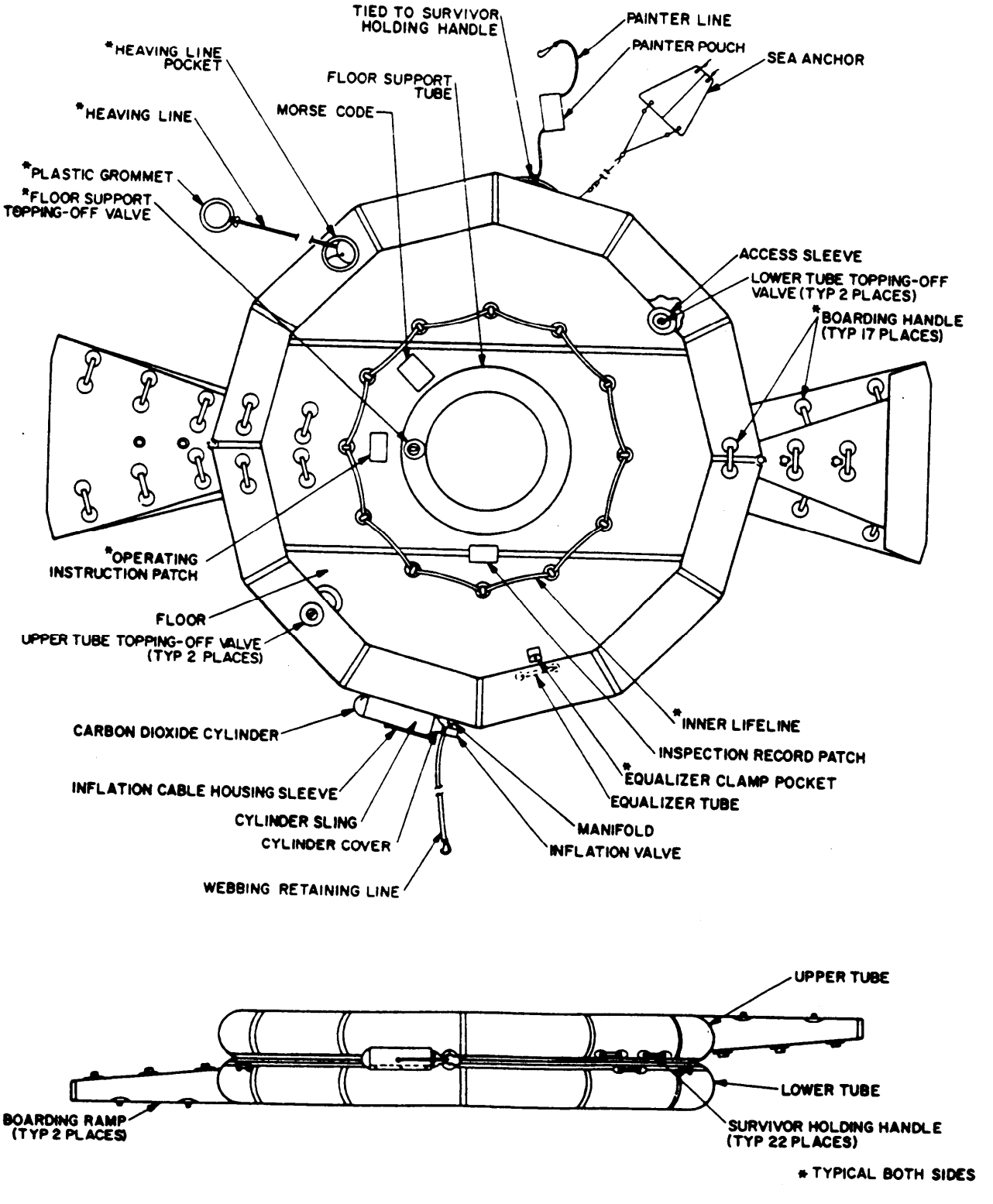

Figure 6-7.—LRU-15/A life raft assembly, parts nomenclature.

chafe the side of the compartment and acts as an anchor, causing the raft to orbit around it. Sometimes it is possible to back off the coupling between the cylinder and the manifold so that the cylinder releases from the mount. Once the cylinder has been removed, it is no longer useful in any way and should be thrown over the side. This, of course, is under actual emergency conditions; in a training demonstration, the cylinder should be saved and recharged for further use on the training equipment.

In demonstrating their use, also give instructions on manual inflation of rafts. If nothing happens after the CO_2 cable has been pulled, the carrying case should be pulled off and the raft unfolded so that the hand pump will be accessible. After the pump is removed, the first compartment to be inflated should be the seat. This will help keep the raft afloat so that the remaining compartment can be inflated with the pump. In attaching the pump, care must be taken not to screw the pump too tightly to the valve. If it is too tight, it may freeze and become impossible to loosen without some type of wrench or pliers.

BOARDING THE RAFT

The best method for boarding the multiplace life raft is to use the boarding stirrup located on the stem of the LRU-12/A, -13/A, and -14 series. This stirrup will allow the aircrewman to board the raft from the stern; boarding from the stern will lessen the possibility y of capsizing the raft (fig. 6-8).

If the raft should capsize, it is best to approach it from the side on which the CO_2 cylinder is installed. The survivor reaches across the raft and grasps the righting handle farthest from the cylinder. Then, by sliding back into the water and pulling on the righting handle at the same time, the raft will turn right side up. By using this method, there will be no chance of the CO_2 cylinder hitting the survivor when he rights the raft (fig. 6-9).

Another important point to remember in righting the raft is to note the wind and take advantage of it. It is very hard to right a raft against the wind.

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Figure 6-8.—Boarding the LR-1 raft.

SAFETY PRECAUTIONS IN BOARDING RAFTS

Extreme care should be taken when boarding rafts or assisting personnel into the raft from the water. This is particularly so if these persons are wearing parachute harness or life vests. Once in the raft, all personnel should seat themselves on the floor and remain in that position if at all possible. Movement within the raft should be restricted as much as possible to keep friction at a minimum. All sharp objects should be collected and stored, especially jeweled rings, wristwatches, etc.

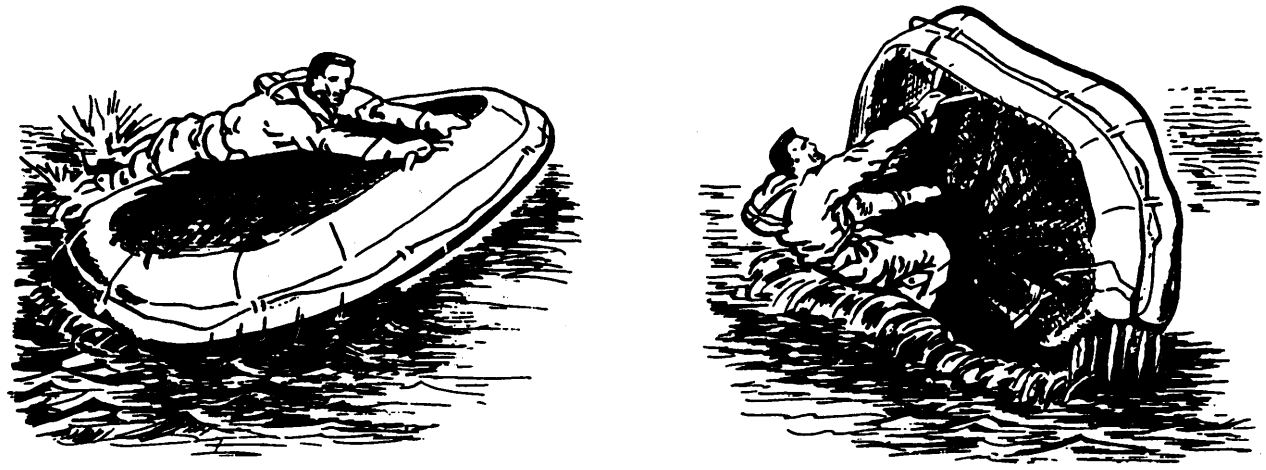

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Figure 6-9.—Righting a capsized raft.

All loose articles of equipment should be properly packaged to protect the raft fabric.

ONE-MAN LIFE RAFTS

One-man life rafts are used with various soft and hard types of survival kits. They are intended for use by aircrew members forced down at sea. They can also be used when forced down over land for fording rivers and streams, or as a shelter.

LRU-7/P LIFE RAFT ASSEMBLY

The LRU-7/P consists of a simplified one-man life raft, a static line release mechanism, and a special container with tabs for attachment to the parachute and seat pan. Although simplified in its construction, the LRU-7/P is comparable to the standard Navy one-man life raft except it contains no survival items (fig. 6-10). The

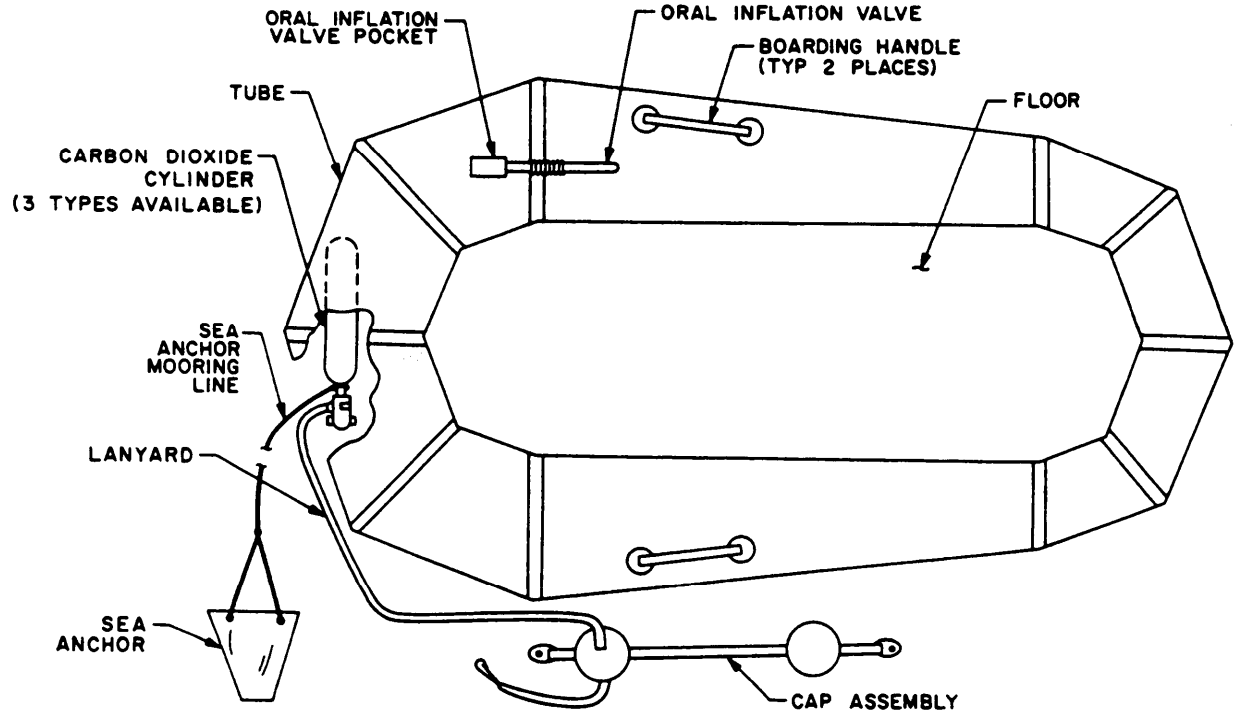

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Figure 6-10.—LRU-7/P life raft assembly, parts nomenclature.

LRU-7/P is used with a modified SP-1A seat pan and NS-3 and NES-21A parachutes.

LR-1 LIFE RAFT ASSEMBLY

The LR-1 life raft assembly consists of an inflation assembly (carbon dioxide cylinder and inflation valve) and a one-man life raft; three types of carbon dioxide cylinders and three types of inflation valves are approved for service use.

The raft consists of a single-compartment flotation tube with a noninflatable floor. It is blue (when initially procured) and features a weathershield, sea anchor, sea anchor pocket, and a retaining line pocket. The weathershield is a dull sea-blue color on the outside and a bright red on the inside. In addition, a directive compliance patch and an inspection record patch are included for record keeping. The various applications of the LR-1 life raft are contained in NAVAIR 13-1-6.1.

Emergency survival equipment (when used) is secured to the raft by either a securing line or a drop line, as applicable. The packaged configuration of an LR-1 life raft assembly, including survival items, varies according to application.

To makeup a packaged assembly, the required components must be individually requisitioned, unless otherwise specified.

The LR-1 life raft assembly is inflated either manually by pulling the inflation assembly actuating lanyard, or automatically on the LR-1 (RSSK) by gravity drop on the kit actuation. The inflation assembly inflates the flotation tube. After boarding the raft, you can top off the LR-1 by using the oral inflation valve.

This section describes the components of the LR-1, the survival equipment, and the procedures for performing inspections and maintenance. We will not repeat procedures that parallel those already outlined for multiplace rafts.

Flotation Tube

The body of the raft consists of an encircling tube, which is one continuous chamber. There are no internal bulkheads as in the multiplace rafts. Various attachments to the flotation tube are shown in figure 6-11.

Oral Inflation Tube

The valve on the oral inflation tube closes automatically by spring pressure when it is not held open. The valve is locked shut by turning the

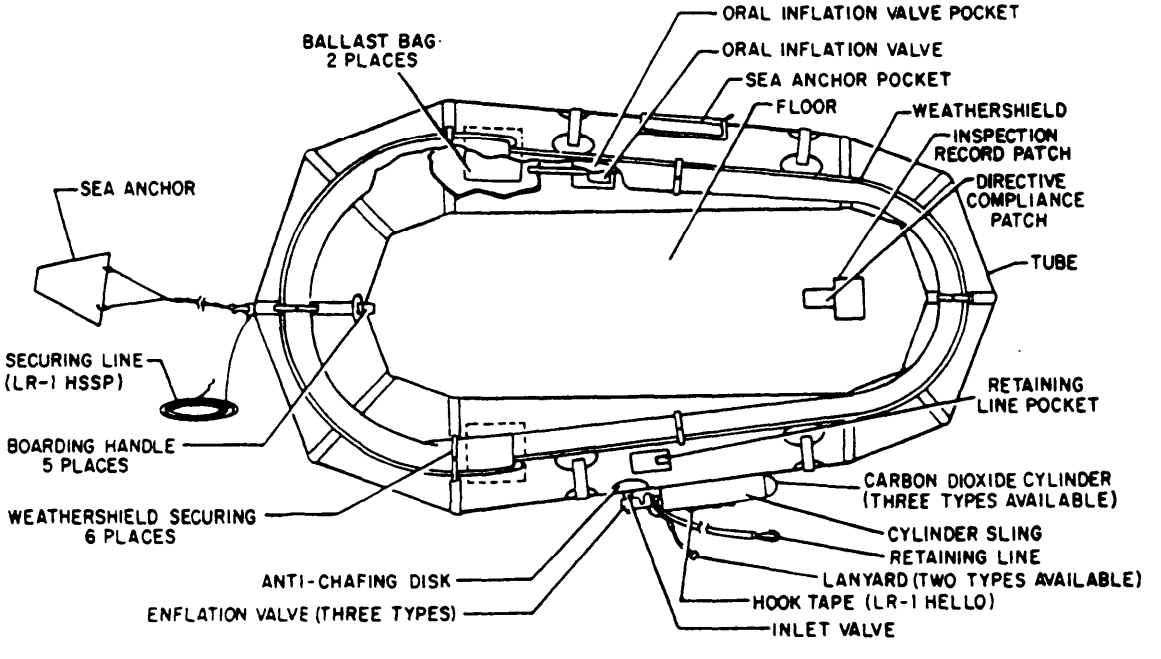

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Figure 6-11.—LR-1 life raft assembly.

mouthpiece in a clockwise direction. The 3/8-inch oral inflation tube is cemented to the valve at one end, and at the other end, it has a molded flange that is cemented to the flotation tube.

Boarding Handles

Five handles are provided as aids for boarding the raft.

Ballast Bags

Ballast bags, installed at two locations, are required to increase the raft stability, to prevent the raft from becoming airborne during helicopter pickup, and to aid in boarding the raft.

Weathershield

The weathershield is used to protect the survivor from adverse weather.

Sea Anchor

The sea anchor is used to keep the inflated raft from drifting. The sea anchor is tied to the raft mooring line with type III nylon line, using a bowline knot; the other end is tied to the sea anchor mooring patch with a bowline knot. The bitter ends of both knots are seared and completed with an overhand knot to prevent them from untying. Before tying the knots, the ends of the nylon line are heat fused to prevent fraying.

Sea Anchor Pocket

The purpose of the sea anchor pocket is to prevent survivors from getting tangled up in the sea anchor line while boarding the raft. Downed aircrewmen should remove the sea anchor from the pocket and cast the anchor adrift immediately after boarding the raft.

Securing Line

The securing line is 5 feet of nylon cord. It secures the raft to the raft container, to prevent loss of the survival items.

The nylon cord is inserted through the webbing loop on the sea anchor mooring patch and secured with a bowline knot, followed by an overhand knot. The free end is secured to the raft container during the raft packing.

Retaining Line

A nylon webbing retaining line 1 inch wide and 6 1/2 feet long is used to secure the raft to the user. One end of the retaining line is equipped with a snap hook. The other end is secured to the CO_2 cylinder neck by passing the end of the retaining line with the loop formed in it around the coupling nut between the raft and the inflation assembly. The end of the line containing the snap hook is then passed through the loop and pulled up tight.

Survival Items

The LR-1 packaged assemblies requiring survival items are equipped with the items listed in table 6-6. These items are packed in either the

Table 6-6.—LR-1 Life Raft Survival Items

DESCRIPTION	QUANTITY REQUIRED
Dye Marker	2
Distress Signal, MK-13 MOD 0 (2) or Distress Signal, MK-124 MOD 0	2
Emergency Radio Beacon AN/URT-33A	1
Battery Power Supply	1
Water, Drinking, Canned, Emergency (1)	1
Opener, Can, Hand	1
Cord, Nylon, Utility, 50 feet	1
SRU-31/P Individual Survival Kit (Part 1 - Medical, Part 2 - General)	1
Ground Air Emergency Code Manual	1
Combat Casualty Blanket Type II, 3 oz.	1
Bailing Sponge	1
Personnel Lowering Device (1)	1

NOTES:
1. Optional item.
2. The MK-13 shall be used until depleted. The MK-124 will replace the MK-13 as stock becomes available.

combination carrying case and equipment container or in the equipment container, as applicable. The remaining space in the container may be used for any specialized equipment for specific environmental or geographic conditions, as directed by the area commander.

You should refer to NAVAIR 13-1-6.1 for information concerning which type of packaged LR-1 life raft assembly is used aboard certain types of aircraft.

Inspection

During the life raft inspection phase and prior to starting any packing procedures, the life raft must be updated and modifications incorporated if required. Compare the life raft assembly configuration with the applicable raft modifications listed in NAVAIR 13-1-6.1.

All life raft assemblies get a calendar inspection upon issue and at intervals that coincide with the aircraft inspection cycle. However, the interval between calendar inspections must not exceed 231 days.

The procedure for inspecting and testing the life raft is generally the same as those given earlier in this chapter for the multiplace life raft. Additionally, you should read NAVAIR 13-1-6.1. Where there are considerable differences in raft construction, certain steps may be eliminated or added as necessary. For example, life rafts are not constructed with internal bulkheads. Since there is only one continuous flotation tube, the internal bulkhead test is not necessary on the life raft. The life raft is fitted with an oral inflation tube, but it serves the same purpose as the multiplace raft topping-off valves. Therefore, the same general considerations given the topping-off valve should be applied to the oral inflation tube. For instance, although the exposed end of the oral inflation tube has no rough edges, it is kept in a supporting pocket.

LIFE PRESERVERS

Life preservers are worn by aircrew members on overwater flights. Their function is to keep them afloat until a raft can be reached or until a rescue team arrives. Proper inspection, maintenance, and handling of life preservers are necessary to prevent any possible malfunction that could result in the loss of life.

LPU-21/P SERIES LIFE PRESERVER ASSEMBLY

The LPU-21/P series life preserver assembly is authorized for use by all aircrew personnel wearing compatible flight clothing. It is designed as a constant wear item for use with the survival vest and will not interfere with the removal of the nonintegrated parachute harness. Survival item pouches are attached to the life preserver casing. The dye marker and signal flares that go into these pouches are not initially supplied and must be individually requisitioned. Modifications to the LPU-21/P life preserver have resulted in a new letter designation being assigned to the preserver. For the sake of clarity, the term LPU-21/P series is used where appropriate.

WARNING

THE LPU-21/P SERIES LIFE PRESERVER ASSEMBLIES ARE NOT USED IN EJECTION SEAT AIRCRAFT.

NOTE: The LPU-21B/P and LPU-21C/P life preserver assemblies must NOT be configured with the FLU-8A/P automatic inflation device.

The LPU-21/P and LPU-21A/P life preserver assemblies use pull toggles for activation. After the incorporation of Aircrew System Change 405, which directs installation of beaded inflation handles, the LPU-21/P and LPU-21A/P were updated to become the LPU-21B/P. The beaded inflation handles improve toggle accessibility and provide the inflation system with a multidirectional pull capability.

The LPU-21/P series life preserver assembly weighs 4 pounds (without survival items) and provides a minimum of 65 pounds of buoyancy. The flotation assembly is constructed of polychloroprene-coated nylon cloth and consists of two independent flotation chambers. One chamber consists of the left waist lobe joined by a tube to the right collar lobe. This chamber is serviced by the carbon dioxide inflation assembly and oral inflation valve attached to the left waist lobe. The other chamber consists of the right waist lobe joined by a tube to the left collar lobe. This chamber is serviced by the carbon dioxide inflation assembly and oral inflation valve attached to the right waist lobe. The two chambers are sewn together at the collar lobes (fig. 6-12).

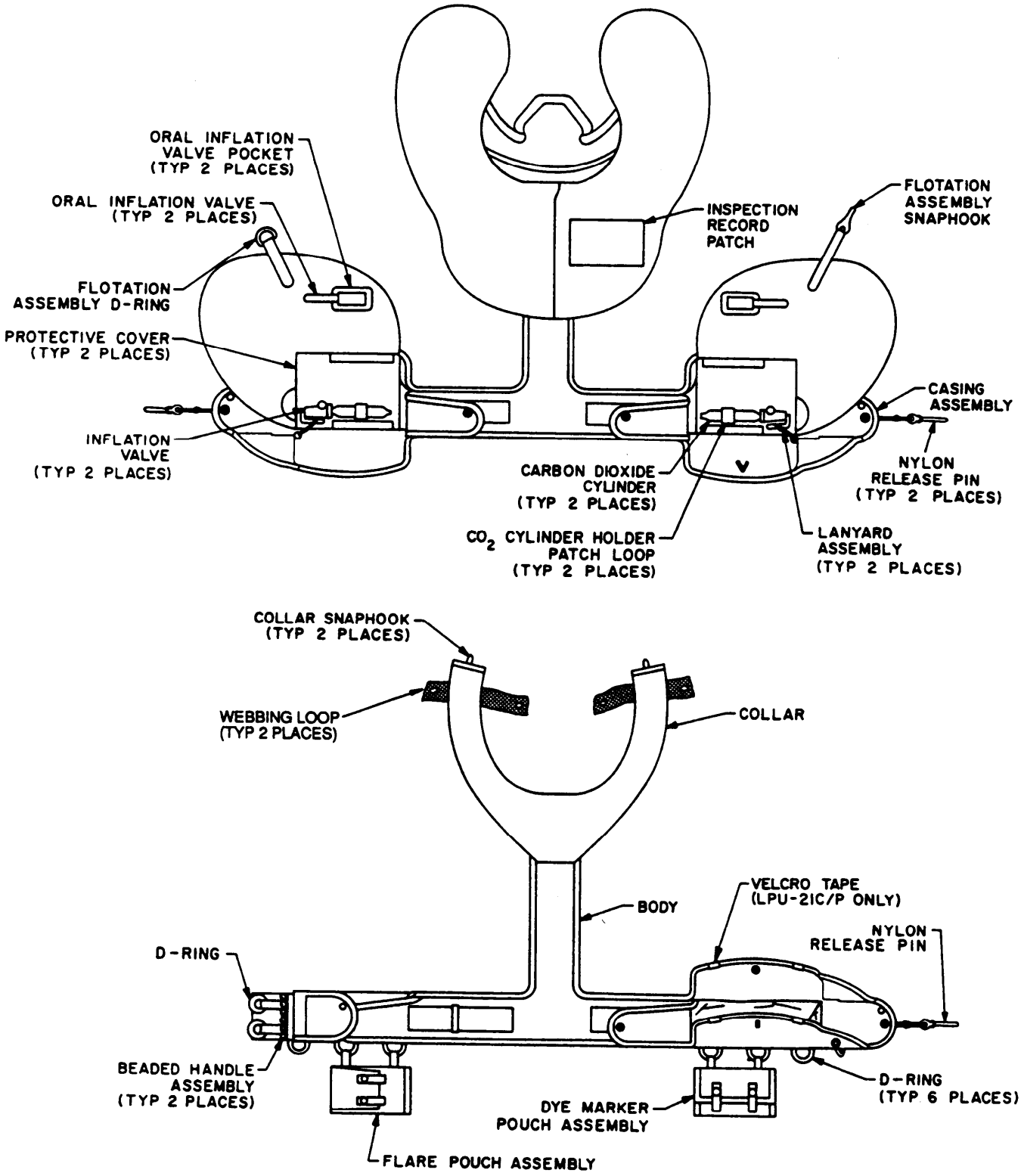

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Figure 6-12.—LPU-21/P series life preserver assembly, parts nomenclature.

Each waist lobe of the flotation assembly is equipped with an attachment patch used for securing the casing assembly by means of rivets. In addition, the right waist lobe is equipped with one snap hook and the left waist lobe is equipped with one D-ring. The snap hook and the D-ring are used to secure the waist lobes together after inflation. Survival item pouches are fastened to the life preserver D-rings with directional snap fasteners.

Each collar lobe of the flotation assembly is equipped with a snap hook for attachment to the survival vest D-rings (parachute risers are routed outside of the collar lobes). In addition, an inspection record patch is also provided on a collar lobe.

The casing assembly is constructed of fire-retardant Aramid cloth and protects the flotation assembly. The casing assembly also provides for size adjustment and attachment to the wearer. The casing assembly consists of the adjustable casing, an adjustable webbing belt, belt keepers and D-rings, and the front connector assembly.

The webbing belt, attached to the inside waist portion of the casing assembly, provides for waist size adjustment from 30 to 44 inches. The webbing belt keeper loops retain the webbing belt and provide for attachment of the survival vest about the wearer's waist. In addition, there are six D-rings secured to the webbing belt keeper loops, used for attaching the survival item pouches, a raft retaining line, and other accessories.

Hook and pile tapes, attached to the outside waist portion of the casing, are used for slack adjustment. In addition, hook and pile tapes, attached about the circumference of the collar casing and the lower edge of the back portion of the casing, are used to enclose the casing assembly about the flotation lobes.

The casing assembly is secured around the wearer's waist by the front connector assembly, which. consists of two snap hooks and two D-rings backed by webbing pads for comfort.

Each inflation assembly is made up of a carbon dioxide cylinder and an inflation valve. The inflation assemblies are connected to valve stems attached to each waist lobe (each valve stem is equipped with a check valve to prevent leakage).

As stated earlier, the LPU-21/P series life preserver assembly is authorized for use by all aircrew personnel wearing compatible flight clothing. LPU-21 /P series life preservers that are modified to incorporate the FLU-8/P series automatic inflation device will be used in ejection seat type of aircraft only. LPU-21/P series life preservers modified with the FLU-8A/P inflator will be redesignated the LPU-23A/P life preserver.

The LPU-21/P series is manually inflated by pulling both inflation assembly beaded handles in a natural, slightly down and straight out position from the body. This action removes the retaining pins securing the casing assembly about the waist lobes and actuates the inflation assemblies. The hook and pile tapes securing the casing assembly about the collar lobes will separate as the preserver inflates.

NOTE: The casing must be manually opened and the flotation assembly unfolded prior to inflating a preserver through the oral inflation valve.

In an emergency situation, the oral inflation valves may be used to top off an inflated preserver, maintain inflation of a leaky preserver, or inflate a chamber if an inflation assembly malfunctions. The oral inflation valves are also used to inflate a preserver with air during an inspection test and to evacuate a preserver in preparation for packing.

LPU-23/P SERIES LIFE PRESERVER ASSEMBLY

The LPU-23/P series life preserver assemblies contain an automatic inflator that is intended for use by an aircrew member in an ejection seat aircraft ONLY.

The LPU-23/P assembly is identical to the LPU-21/P assembly except for the FLU-8A/P automatic inflation device (fig. 6-13).

The LPU-23/P series life preserver assembly is inflated either automatically (by immersion in fresh or salt water) or manually (by pulling both inflation assembly beaded handles).

NOTE: The primary means of inflation is to manually pull the beaded handles.

Automatic inflation occurs when immersion in water triggers the electronic circuit, firing the explosive primer. The high-pressure primer forces the piecing pin forward, releasing the inner end of the packing cord loop and puncturing the 35-gram CO_2 cylinder, which releases the pressurized gas. Automatic inflation is a onetime function of the FLU-8A/P inflator. A new inflator must be installed to replace the previously spent device. Manual inflation occurs when both

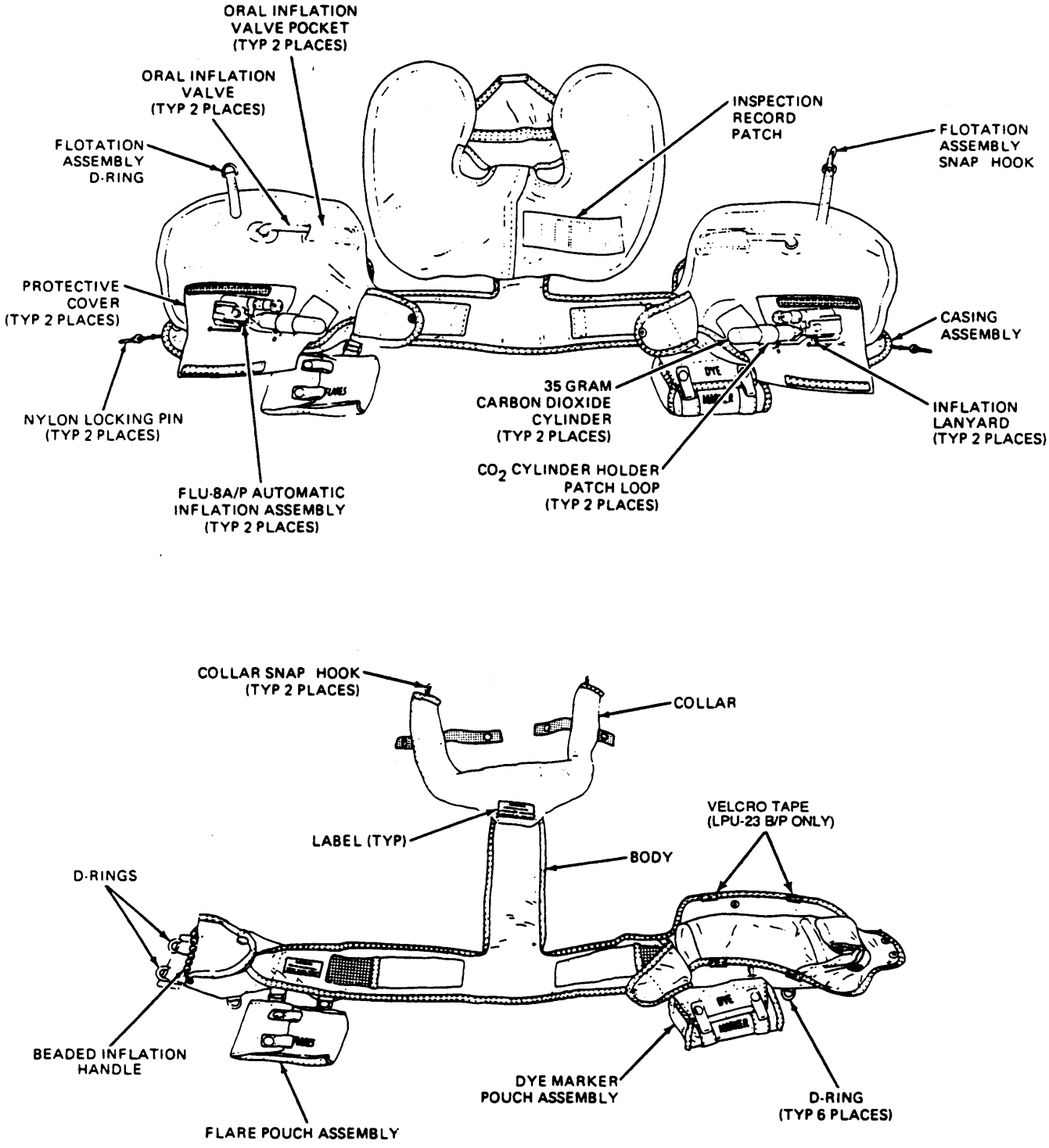

Figure 6-13.—LPU-23/P series life preserver assembly, parts nomenclature.

beaded inflation handles are pulled in a natural, slightly down and straight out position from the body. The FLU-8A/P inflator may be operated manually an unlimited number of times without affecting the onetime automatic feature.

LPU-24/P SERIES LIFE PRESERVER ASSEMBLY

The LPU-24/P life preserver assembly is identical to the LPU-23/P life preserver assembly except for the fabrication of the casing assembly. The LPU-24/P has a casing assembly that is constructed from rubber-coated nylon cloth instead of Aramid, fire-resistant fabric like the LPU-21/P and the LPU-23/P series life preservers. The LPU-24/P life preserver is not covered in this chapter.

LPP-1/1A LIFE PRESERVER ASSEMBLY

The LPP-1/1A life preserver assembly is authorized for use by passengers in cargo or transport type of aircraft for sea survival situations.

WARNING

THE LPP-1/1A LIFE PRESERVER IS NOT SUITABLE FOR USE BY SMALL CHILDREN IN NAVAL AIRCRAFT.

The LPP-1 and LPP-1A life preserver assemblies are identical with the exception of the mechanical inflation assembly.

The LPP-1/1A life preserver assembly (fig. 6-14) weighs approximately 3 pounds and provides a minimum of 29 pounds of buoyancy. The LPP-1/1A life preserver assembly consists of a single-compartment yoke-type flotation assembly, a pouch and belt assembly, an inflation assembly, and a storage container. Survival items are also provided. To make up the LPP-1/1A life preserver assembly, all required components not supplied with the preserver must be individually requisitioned.

The flotation assembly is constructed of chloroprene-coated nylon cloth. It is equipped with an oral inflation valve, a valve stem, survivor locator light attachments, a whistle pocket, a belt loop, and an inspection record patch (fig. 6-14).

The pouch and belt assembly consists of a rubber-coated nylon cloth pouch and an adjustable belt. The pouch contains the flotation assembly and survival items. The belt consists of a 53-inch piece of webbing, an adjustable buckle and clasp, a toggle assembly, and a toggle assembly pocket. The belt adjusts from a waist size of 30 to 52 inches and attaches the flotation assembly and pouch to the wearer by means of the belt loop on the flotation assembly and the slots in the back of the pouch. The toggle assembly consists of a wooden toggle and line, and is used to secure survivors together while they are in the water. When not in use, the toggle line is wrapped around the wooden toggle and stowed in a pocket located on the belt (fig. 6-14).

NOTE: The carbon dioxide cylinder is NOT supplied with the preserver assembly and must be requisitioned separately.

The LPP-1 inflation assembly consists of a Type I (MIL-C-25369), 25- to 28-gram carbon dioxide cylinder and an inflation valve. The LPP-1A inflation assembly consists of a Type II (MIL-C-25369), 28- to 31-gram carbon dioxide cylinder and an inflation valve (MIL-I-23145). The inflation assembly is connected to the valve stem on the front of the flotation assembly. The valve stem is equipped with a check valve, which prevents leakage.

The storage container is used to store the life preserver assembly when it is not in use. The storage container also has donning instructions printed on it.

As LPP-1/1A life preservers become available, the use of all other life preservers by personnel authorized to use the LPP-1/1A will be discontinued. Passengers whose total clothing and equipment weight does not exceed 15 pounds and who are not carrying any high density items like weapons or other similar metallic items are authorized to continue use of MK-2 life preserver, with attritional basis method for replacement with LPP-1/1A.

LPU-30/P LIFE PRESERVER ASSEMBLY

The LPU-30/P life preserver assembly is a vest-type preserver (cardigan style, sleeveless) that weighs approximately 3 pounds (without survival items) and provides a minimum of 29 pounds of buoyancy. The preserver consists of a single-compartment flotation assembly, a fully lined

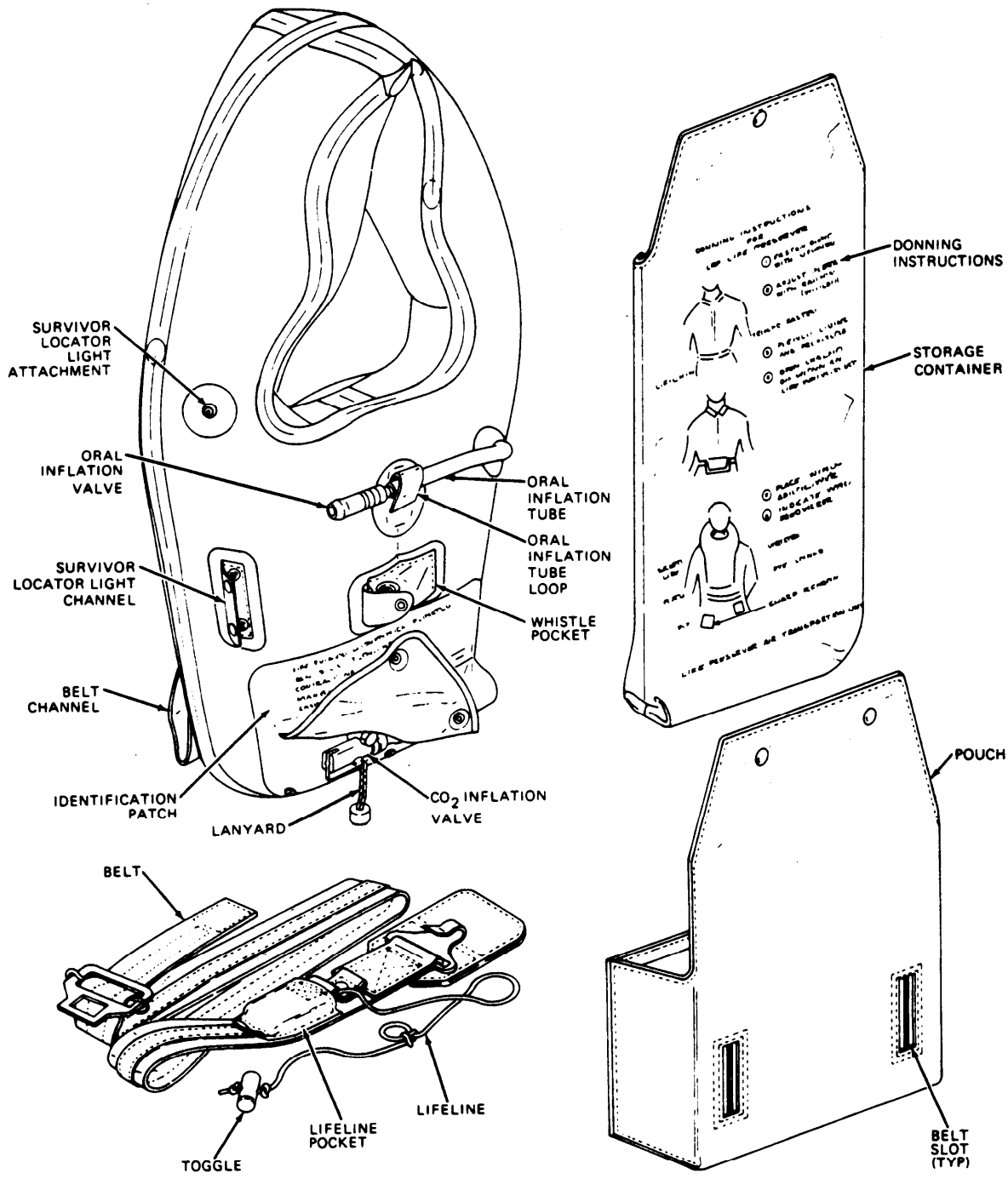

Figure 6-14.—LPP-l/A life preserver assembly.

protective cover with nondirectional front closure snaps, side buckle adjustments, and inflation assembly. Survival items are also provided. To make up the LPU-30/P life preserver assembly, all required components and survival items must be individually requisitioned (fig. 6-15).

The flotation assembly is constructed of polyurethane-coated nylon cloth and is available in one size. It is equipped with an oral inflation valve and tube, a pressure relief valve to prevent over inflation, a brass manifold for attachment of the inflator, a l-inch piece of hook tape secured to the left front portion of the bladder, and an antichafing pad sewn to the inside neck area on the bladder.

The protective cover is fabricated of white cotton balloon cloth (MIL-C-332) and is available in medium (chest up to 48 inches, & 1/2 inch) and large (chest up to 53 inches, ± 1/2 inch). The cover has nondirectional front closure snaps and side buckle waist adjustments and is fully lined. There is also a strip of reflective tape sewn across each shoulder and a strobe light pouch, which must be sewn to the upper breast portion of the protective cover, and a sea dye marker pouch, which must be sewn to the lower left portion of the protective cover.

The inflation assembly consists of two Type II (MIL-C-601), 12-gram CO_2 cylinders and a Type III (MIL-I-23145) inflation valve. The inflation assembly is connected to the valve stem located on the right front of the flotation assembly. The valve stem is equipped with a check valve to prevent leakage.

The LPU-30/P is manually inflated by pulling the inflation assembly lanyard down. In an emergency situation, the oral inflation valve is used to top off an inflated preserver, maintain inflation of a leaky preserver, or inflate a preserver when the inflation assembly malfunctions or fails. The oral inflation valve is also used to inflate a preserver with air during an inspection test and to deflate a preserver in preparation for issue.

The LPU-30/P life preserver is used by passengers in all helicopters and in the C-1, C-2, and US-3A type aircraft. The LPU-30/P must not be confused with the MK-1 flight deck life preserver. Information on the MK-1 preserver can be obtained by contacting Naval Sea Support Center Pacific, P.O. Box 85548, San Diego, CA 92138-5548, ATTN: Code 914. Request MIP H-402/2-47.

LIFE PRESERVER INSPECTIONS

All life preservers need to have preflight, special, and calendar/phase inspections.

The preflight inspection is performed before each flight by the aircrewman to whom the life preserver is assigned. A preflight inspection is also performed by assigned aircrewmen on life preservers installed in aircraft.

The special inspection is done on all aircraft-installed life preservers at intervals not to exceed 30 days. The inspection is performed at the organizational level of maintenance by personnel assigned to the aviator's equipment branch.

When the special inspection is completed and the life preserver is found satisfactory, the inspection date and inspector's signature are written in the inspection section of the Aviation Crew Systems History Card. The 30-day special inspection may be recorded on a separate history card from the history card recording calendar/phase inspections, functional checks, and modifications.

NOTE: The calendar inspection interval for LPA type and LPU-21/P series preservers assigned to VP squadron selected air reserve aircrewmen has been extended to 180 days from 90 days, providing the preservers are stowed under controlled conditions.

The calendar/phase inspection must be performed on all life preservers prior to placing them in service. After that, the inspection cycle is as follows: personal issue life preservers are inspected once every 90 days. Aircraft-installed life preserver inspection should coincide with the inspection cycle of the aircraft in which installed. In no case should the interval exceed 231 days. Unless operational requirements demand otherwise, the life preserver calendar/phase inspection is performed by the intermediate level of maintenance or above. As part of inspecting the preserver, the functional test is performed prior to placing it in service, every fourth inspection cycle thereafter, and whenever an inflation assembly is replaced. Also, the leakage test is performed during every inspection cycle. A battery visual inspection for the LPU-23/P series and LPU-24/P series will be performed prior to placing life preservers in service, and every fourth inspection cycle thereafter.

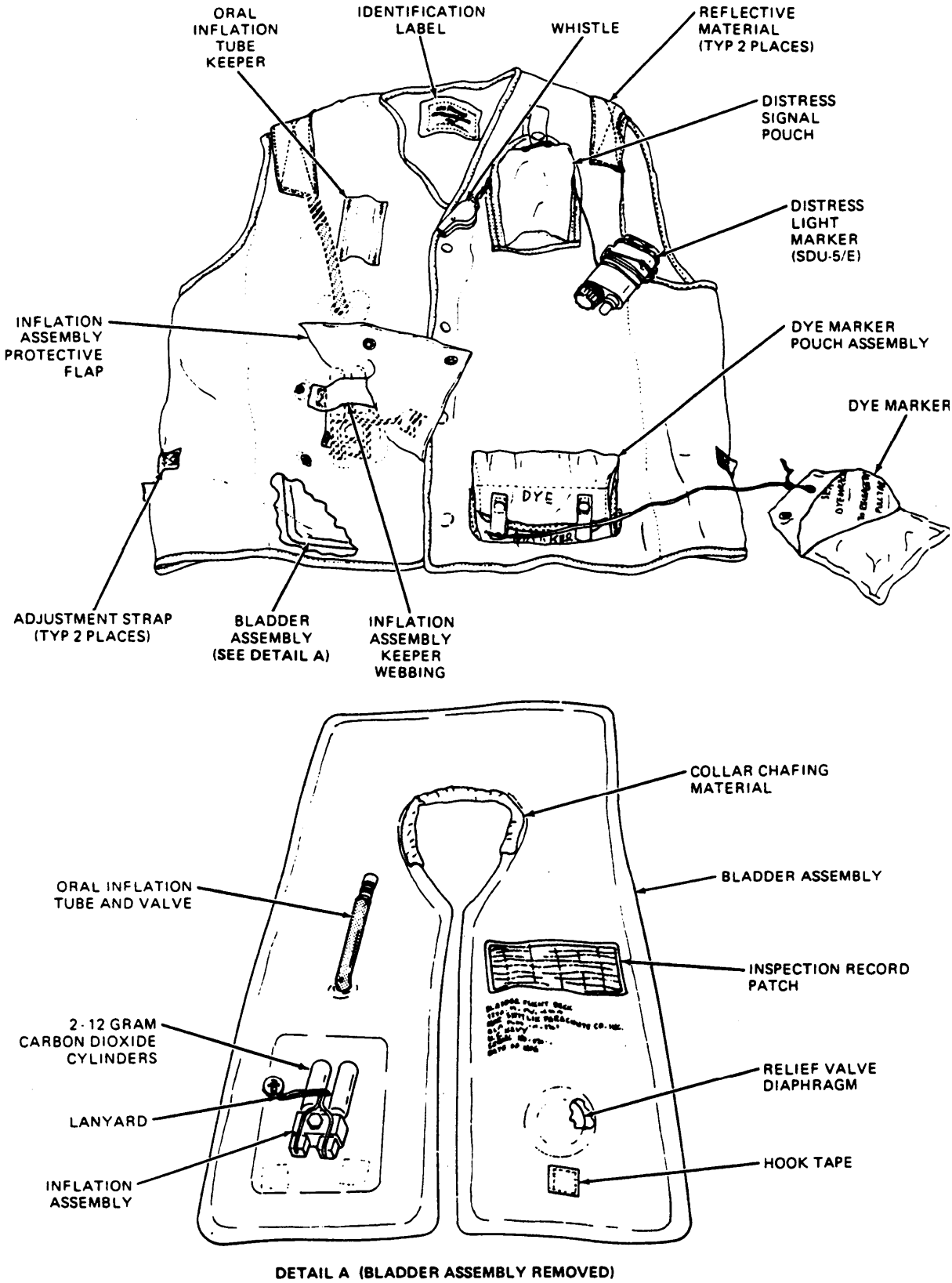

Figure 6-15.—LPU-30/P life preserver assembly, parts nomenclature.

FUNCTIONAL TESTING

Before you attempt to perform a functional test, you should ensure that the work area surrounding the preserver is free of all foreign objects. This is done to prevent any accidental damage to the life preserver. When you perform a functional check, you want to ensure that the system operates as if the aircrew member were using it in an emergency. Therefore, your first step is to pull the actuation toggle.

The preserver should fully inflate to its design shape without any evidence of restriction in less than 30 seconds. If the preserver does not meet this requirement, you will have to determine the reason and correct it. To do this, first look at your stem and valve. Sometimes dirt or foreign matter can cause a slow inflation. If you make any corrections, the preserver is functionally tested again.

Deflate the preserver by using a vacuum pump and a 3/8- or 1/2-inch inside diameter rubber hose. Attach one end of the rubber hose to the vacuum pump, and the other end will go to the oral inflation valve or to the carbon dioxide cylinder valve, depending on which type you are using. After the preserver has been completely deflated, release the oral inflation valve or put the CO_2 cylinder back into the valve.

The functional check is only performed when the preserver is placed into service and every fourth calendar check after that.

LEAKAGE TEST

All life preservers are subjected to a leakage test each calendar/phase inspection. This test is performed each time the preserver comes into be checked, even when a functional test is required. A special test fixture is needed to perform this test.

Test Fixture

A suggested test fixture, consisting of a three-way valve, pressure gauge, and adapters for compartments being tested, is shown in figure 6-16. The fixture must be fabricated to meet the requirements of the schematic shown in figure 6-17.

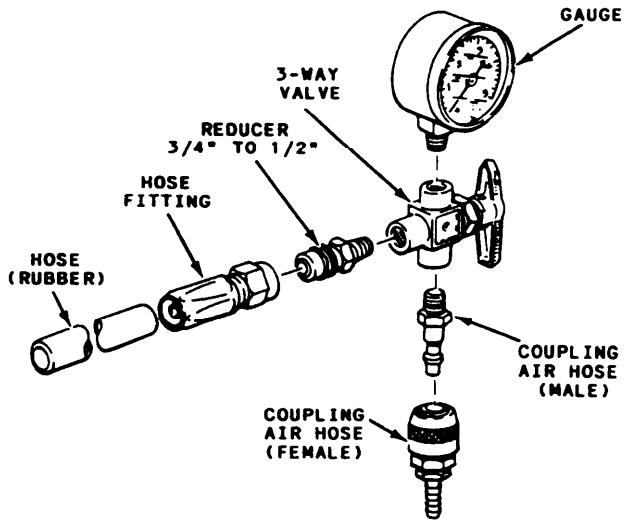

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Figure 6-16.—Leakage test fixture life preserver.

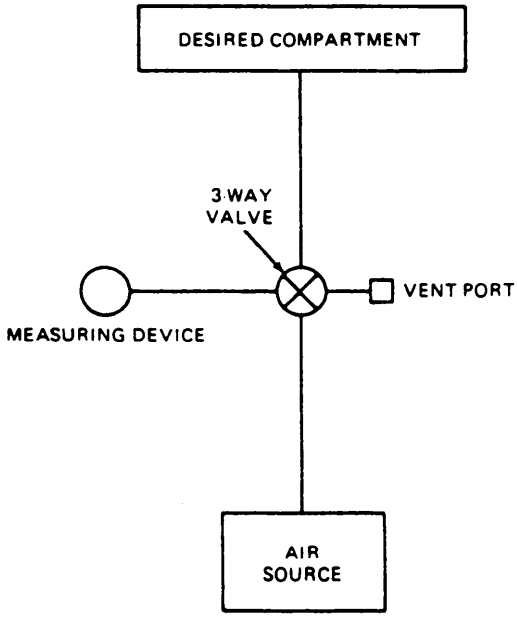

Figure 6-17.—Test rig schematic.

Test Procedure

To test life preservers, proceed as follows:

1. Ensure all carbon dioxide has been removed from any preserver that has been functionally tested.
2. To test the LPU-28/P life preserver, insert a 3/4-inch O.D. rubber hose into the oral inflation

Table 6-7.—Life Preserver Test Pressures

PRESERVER TYPE	FLOTATION CHAMBER TEST SEQUENCE	LEAKAGE TEST PRESSURE (PSIG)	MINIMUM PRESSURE (PSIG)
LPA-2 series	Both Chambers Simultaneously	2.0	1.6
LPU-21/P series	Both Chambers Simultaneously	2.0	1.6
LPU-23/P series	Both Chambers Simultaneously	2.0	1.6
LPU-24/P series	Both Chambers Simultaneously	2.0	1.6
LPU-28/P	Single Chamber Preserver	2.0	1.6
LPU-30/P	Single Chamber Preserver	1.0	0.8
LPP, Pouch Type	Single Chamber Preserver	2.0	1.6

hose mouthpiece. Maintain pressure between the rubber hose and the oral inflation hose mouthpiece to ensure a good seal. Depress the valve on the oral inflation hose and alternately position the leakage test fixture valve between the measuring device, vent, and air supply until the overpressure relief valve opens (2.5 psig ± .5 psig). Rotate the leakage test fixture valve to the measuring device position to ensure that the life preserver is inflated to the proper pressure. Release the valve on the oral inflation hose. Inspect for proper operation of the relief valve.

3. To test all preserver chambers, except LPU-28/P, unlock the oral inflation valve and insert it into the rubber hose. Rotate the valve to the air supply position and inflate the chamber. Alternately position the valve between the measuring device, vent, and the air supply until the proper pressure is attained.

4. Turn off the air supply, and after a minimum of 15 minutes, readjust the pressure, if necessary, to the original pressure. Refer to table 6-7.

5. Disconnect the air supply and check test fixture for leaks. Ensure all valves are closed.

6. Record temperature and barometric pressure.

7. Four hours after the adjustment period in step 4, record the test pressure.

8. Record temperature and barometric pressure and correct test pressure for any changes in temperature and barometric pressure. Figure 6-18 is an example of how you would record this information.

EXAMPLE

UNCORRECTED TEST READING 1.70 PSI

	TEMP.	BARO.
START	75°F	29.90 IN. Hg
END	70°F	29.70 IN. Hg
DIFFERENCE	−5°F	−.20
CORRECTION	+.155	−.098

TEMP. CORRECTION	+ .155
+ BARO. CORRECTION	− .098
CORRECTION	+ .057
UNCORRECTED READING	1.700 PSI
+ CORRECTION	+ .057
CORRECTED READING	1.757 PSI

Figure 6-18.—Example for recording readings.

CAUTION

DO NOT SUBMERGE LPU-23/P SERIES AND LPU-24/P SERIES LIFE PRESERVERS IN WATER TO CHECK FOR LEAKS.

After 4 hours, if the pressure of the chamber is below 1.60 psig, inflate to leakage test pressure and coat with a soap solution to locate any leaks. Mark any leak area you find. Rinse the preserver with fresh water, air dry it, and repair it in accordance with NAVAIR 13-1-6.1.

If the preserver has held the required pressure, deflate it. Ensure that the inflation valve lever is cocked. Install a carbon dioxide cylinder.

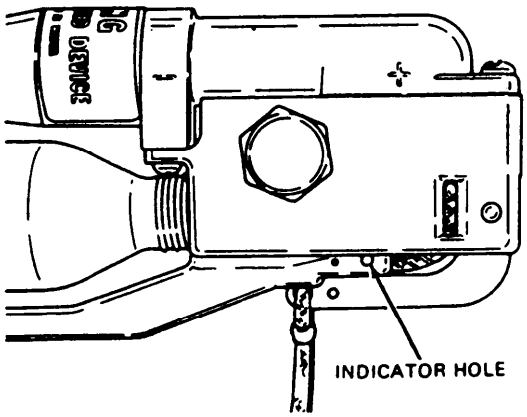

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Figure 6-19.—Checking for silver indicator.

This completes the testing for leaks within the flotation assembly. To complete the calendar inspection, you will have to inspect the remaining components of the life preserver.

VISUAL INSPECTION

The visual inspection is performed along with each calendar inspection, at which time it is performed before you perform the leakage test. To perform a visual inspection, inflate the preserver to 1 psi and look it over real good. Look for any fabric cuts, tears, deterioration, or abrasion. Any of these defects can cause leakage. Check the valve stem for security and ensure that the silver indicator is not visible in the firing check port (indicator hole) (LPU-23/P and LPU-24/P). See figure 6-19. If the silver indicator is visible, the inflator is spent and the automatic feature of the inflator is negated. A new inflator should be installed on the life preserver to replace the previously spent inflator. Refer to NAVAIR 13-1-6.1.

LPU-23/P and LPU-24/P series preservers use the FLU-8A/P automatic inflator. The service life of each FLU-8A/P series automatic inflator is 66 months from the date of manufacture. If service life expires prior to the next scheduled calendar inspection, replace the inflator. Refer to NAVAIR 11-100-1, *Cartridges and Cartridge Actuated Devices for Aircraft and Associated Equipment*. Also refer to NAVAIR 13-1-6.2, section 2-5, *Cartridges and Cartridge-Actuated Devices (General Safety Instructions).*

Battery Visual Inspection, LPU-23/P (Series) and LPU-24/P (Series)

To inspect the batteries installed in the FLU-8A/P series inflator, proceed as follows:

WARNING

NO OBJECTS SHOULD BE INSERTED IN SENSOR PLUG SIDE PORTS FOR ANY REASON.

With the aid of a standard 17/32-inch socket, remove the sensor plug cap. Remove the battery and check it for leakage and corrosion. Check the sensor plug cap for cracks. The battery has a two-letter code stamped on it that corresponds with the month and year of manufacture. The date of manufacture for the battery, PN 849AS 160, is displayed in the lot number stamped on the battery case. The battery has a total life of 4 years from the date of manufacture. Replace any battery if the total life of the battery expires prior to the next calendar inspection. Check this date of manufacture on each battery. Also check the date of installation recorded on the Aviation Crew Systems History Card.

Reinstall or replace battery if needed. Ensure that the date of installation and date of manufacture are recorded on the Aviation Crew Systems History Card. See figure 6-20 for battery arrangement.

Battery Voltage Testing, LPU-23/P (Series) and LPU-24/P (Series)

Before installing any battery, you must be sure that it has enough energy to operate the FLU-8A/P inflator. A digital reading voltage multimeter must be used for this test.

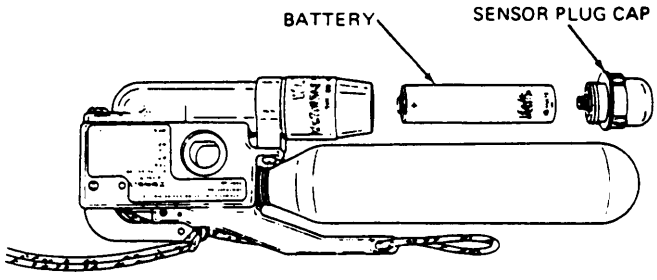

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Figure 6-20.—Battery arrangement.

Do not use a needle voltage multimeter. The test leads of the multimeter should be provided with a standard test probe (+) and a banana type test plug (–). When using the multimeter, you should ensure that it is set in the voltage-measuring mode and NOT the resistance-measuring mode. A resistance measurement will trigger the squib and fire the inflator.

Insert the negative (–) test probe into the end port of the sensor plug. Remove you hand. Faulty readings can be obtained or the squib may fire if the body becomes an electrical pathway between the sensor pin and any conductive part of the inflator assembly. Now, using the pointed positive (+) probe, touch and maintain contact with one of the screw heads near the lever end of the inflator. Refer to figure 6-21.

Wait 15 seconds for the FLU-8A/P circuit to stabilize after connecting the test leads before taking the voltage reading. The voltage reading should begin at a high value and then gradually shift downward before final stabilization. If no downward shift in meter reading occurs, the FLU-8A/P inflator will be rejected.

A reading of +12 volts or more indicates the battery is at full power and installed correctly. A reading of -12 volts or more indicates the battery is installed backwards. The battery must be reversed. A reading of zero volts indicates the battery contact is faulty or the battery is not installed properly. Inspect and correct if necessary. If a correct battery voltage reading cannot be obtained with a battery of verified full charge properly installed, the inflator is defective. Reject and report for an engineering investigation according to Volume III, OPNAV 4790.2.

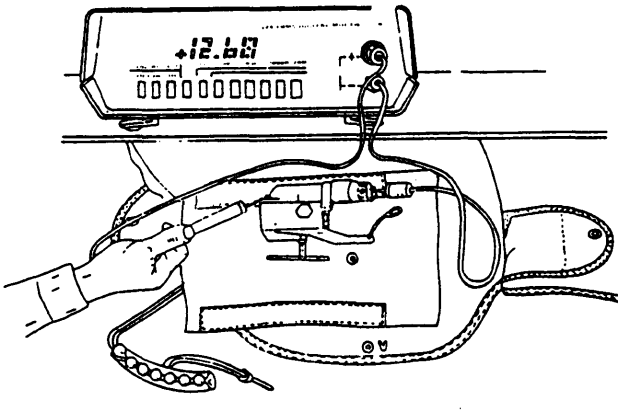

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Figure 6-21.—Testing battery.

INFLATION ASSEMBLY INSPECTION

Inspect life preserver inflation assemblies as follows:

Remove the carbon dioxide cylinder from the valve assembly.

Examine the inflation device, actuating lever and lanyard, and locking pins for fraying, corrosion, stripped threads, and other damage.

If required, remove any sharp edges from the valve with a fine, round file.

On LPU-28/P, LPU-30/P, and LPP life preservers, operate the toggle three or four times. Ensure that the lever moves freely and the piercing pin moves properly inside valve body.

On life preservers with beaded inflation handles, operate beaded inflation handle three or four times. Ensure that the lever moves freely and the piercing pin moves properly inside valve body.

Ensure that the packaging cord loop is not pinched between the piercing pin and the actuating lever. If there is free play in the actuating lever when it is in its cocked position, the packaging cord loop is pinched. If necessary, reinstall the cord. Refer to NAVAIR 13-1-6.1.

NOTE: Each time the inflation assembly gaskets or the inflation assembly is removed and replaced for any reason, a functional test must be conducted. Use new gaskets when you replace the device.

If any discrepancy is noted in the inflation device that is not repairable, remove the assembly and install a new inflation device.

If carbon dioxide cylinder locking screws are installed on LPA type and LPU type life preservers, remove them.

Ensure that CO_2 cylinder locking screws are installed on LPU-30/P life preservers.

Inflation Lanyard Pull Test

Special Equipment Required

Quantity	Description	Reference Number
1	Pull-Scale, 0 to 50 lb	DPP-50 or equivalent

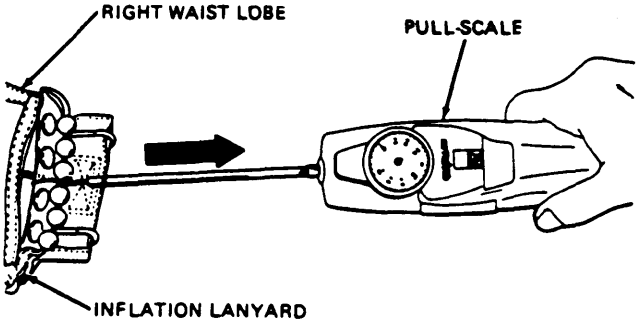

Figure 6-22.—Inflation lanyard pull test.

To perform the inflation lanyard pull test, proceed as follows:

1. Ensure that the carbon dioxide cylinders have been removed. Actuate the inflation assembly. This test is testing the lanyard itself. It isn't designed to test the pull of the inflation assembly.
2. On life preservers with beaded inflation handles, attach a pull scale to top end (end opposite inflation lanyard) of beaded inflation handle (fig. 6-22).
3. On LPP and LPA-1/1A life preservers, attach the pull scale to the actuating lanyard at the binder knot immediately above the knob.
4. Exert a 25-pound straight pull on the inflation lanyard. Remove scale.
5. Examine the inflation lanyard for frays, ruptures, thin spots, split casing, and security of knots.
6. Replace any unsatisfactory inflation lanyards.

Installation of Cylinders: LPA-1/1A (Series), LPA-2 (Series), LPU-21/P (Series), LPU-30/P, and LPP-1 (Series)

Prior to installing any CO_2 cylinder, it must be weighed and the threads cleaned. By using the cylinder thread chaser die, you turn the thread chaser to the full extent of the threads on the CO_2 cylinder to cut free any excessive cadmium plating covering the threads (fig. 6-23).

Weigh the charged cylinder and compare the stamped minimum weight with the scale weight. Discard and replace the cylinder if the scale weight is 2 grams less than stamped minimum weight. Loosen the inflator setscrew if it is installed and ensure that the inflator lever is in the cocked position. To assure a firm cylinder seat, conduct a cylinder thread count. The threaded portion of the cylinder neck must contain a minimum of seven full threads to assure a firm cylinder seat within the valve body. Any cylinder found with less than seven full threads must be discarded.

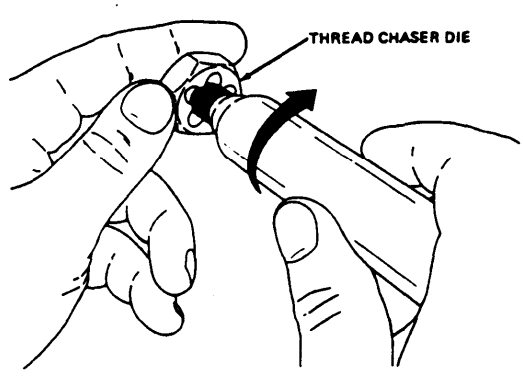

Figure 6-23.—Cleaning threads.

CAUTION

STEEL THREADS ON CARBON DIOXIDE CYLINDERS CAN CAUSE DAMAGE TO ALUMINUM THREADS ON INFLATORS IF THE CYLINDER IS NOT CAREFULLY THREADED. IF BINDING OCCURS DURING THREADING, REPLACE THE CYLINDER.

After performing a functional test, insert a new seat seal gasket from a kit. At intermediate inspection intervals, inspect the condition of the gasket and replace it if necessary. Install the CO_2 cylinder into the inflator as far as hand twisting will permit. Tighten the setscrews, if installed.

NOTE: When you replace the CO_2 cylinder to the inflator, ensure that the CO_2 cylinder passes through the holding patch loop. Do not install the setscrews in LPA-2 and LPU-21/P life preservers. For all other life preservers, a missing setscrew does not warrant removal of the preserver from service until a replacement setscrew can be obtained. Safety-wire the inflator as required.

Installation of Cylinders, LPU-23/P (Series) and LPU-24/P (Series)

To install cylinders, proceed as follows:

Weigh a charged CO_2 cylinder and compare the stamped minimum weight with the scale

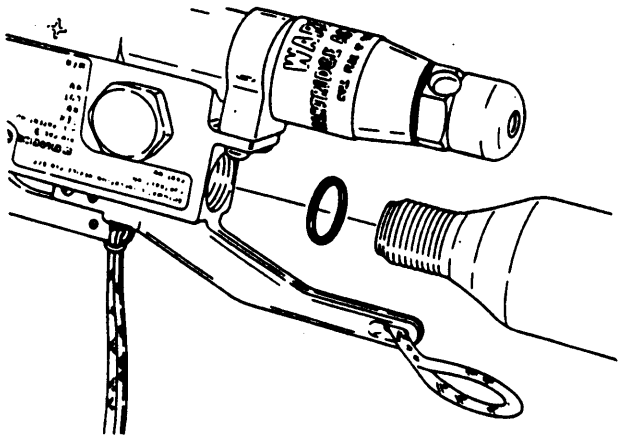

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Figure 6-24.—Inserting new O-ring and CO_2 cylinder.

weight. Discard and replace the cylinder if its scale weight is 2 grams less than its stamped minimum weight.

By using the cylinder thread chaser die, figure 6-23, you turn the thread chaser to the full extent of the threads on the CO_2 cylinder to cut free any excessive cadmium plating covering the threads.

Insert new O-ring and turn the CO_2 cylinder into inflator body as far as hand twisting permits. See figure 6-24.

Battery Replacement, LPU-23/P (Series) and LPU-24/P (Series)

To replace batteries, proceed as follows:

Remove the sensor plug cap with a standard box wrench.

WARNING

BATTERIES MAY EXPLODE IF RECHARGED OR IF THEY ARE DISPOSED OF IN A FIRE.

Remove the old batteries and discard them.

CAUTION

NEVER REPLACE ONE BATTERY; ALWAYS REPLACE THE PAIR.

Remember to record the date of manufacture and the date of installation of new batteries on the Aviation Crew Systems History Card.

NOTE: Batteries have a total life of 2 years from the date of manufacture. Do not install batteries if their total life expires prior to the next scheduled calendar inspection.

Install batteries in accordance with figure 6-20.

WARNING

ENSURE THAT THE SENSOR PLUG CAP IS TORQUED TO THE CORRECT VALUE.

On FLU-8A/P only, torque the sensor plug cap to 5 in-lb using 17/32-inch socket and torque wrench.